American Perfumer AND AROMATICS

ANOTHER AMERICAN PERFUMER
AP
DOCUMENTARY
METHODS • PRACTICE • PROCEDURE
$1.50
JANUARY 1959

THE MAGAZINE OF TASTE AND SCENT

6 timely Articles on ways to prevent Spoilage in Cosmetics

•

PART I

PRESERVATION & ANTIOXIDANTS

(To be concluded in the February Issue)

LOCKWOOD MEMORIAL LIBRARY

UNGERER

Importer
Manufacturer

* FOR 65 YEARS

a fine tradition
in the creation
of basic materials
for PERFUMES and
PERFUME SPECIALTIES

Essential Oils

Aromatic Chemicals

Terpeneless Oils

Oleoresins

True Fruit and Imitation Flavors

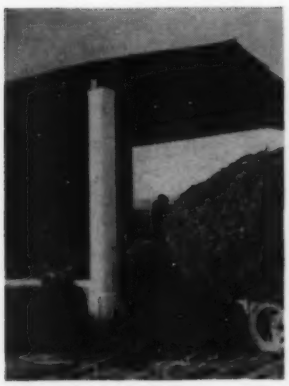
UNGERER & Co. NEW YORK

Ungerer & Co.

161 Avenue of the Americas, New York 13, N. Y.
plant and laboratories
Totowa, N. J.

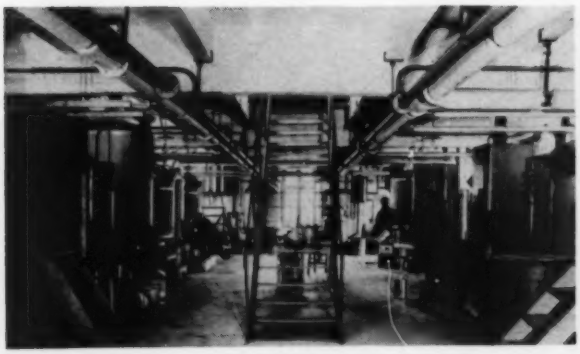
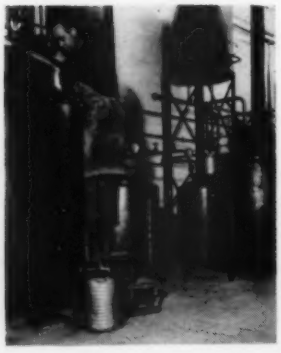
CHICAGO • BOSTON • PHILADELPHIA • ST. LOUIS • LOS ANGELES • ATLANTA

OPAL . . . the aristocrat of glass
For beauty, utility and all-around satisfaction, opal jars are the most desirable containers for cosmetic creams.
Carr-Lowrey brings you opal jars and bottles at their best. Decorated with your own attractive design, they are outstanding containers for your finest products.
complexion
CREAM
GLASS
STIMULATES
SALES
cleansing
CREAM
CREAM
CARR-LOWREY
GLASS CO.
and manufacturers of fine glass containers
Factory and Main Office: BALTIMORE 3, MD.
New York Office: 413 MADISON AVE.
Chicago Office: 1572 MERCHANDISE MART



CAPACITY

QUALITY

for the finest in floral and essential oils

BERTRAND FRÈRES, INC.
443 FOURTH AVE. NEW YORK 16, N.Y.

American Perfumer AND AROMATICS

VOL. 73, NO. 1 JANUARY 1959

Contents

PRESERVATIVES AND ANTIOXIDANTS

Preservation ..... *Linwood F. Tice and Martin G. Barr* 20
Factors to be considered with cosmetic emulsions

Effect of pH on Mold Inhibiting Compounds ..... *F. J. Bandelin* 25
Effect on efficiency of various compounds

Nonionic Emulsifiers ..... *M. G. deNavarre* 31
Effect of interference with Preservatives

Para-Hydroxybenzoic Acid Esters ..... *Earl L. Barkley* 33
Value as preservatives for cosmetics

Combinations of Esters of *p*-Hydroxybenzoic Acid ..... *E. Boehm* 37
Considerations of pertinent interest

Sorbic Acid as a Preservative ..... *M. G. deNavarre* 40
Factors to be considered

DEPARTMENTS

News 9, 53
Desiderata 15
Questions and Answers 6
Packaging and Promotion 50
New Products and Ideas 42
Market Reports 63
Index to Advertisers 66

Cover photo by John H. Muller

OFFICES

LOS ANGELES
McDonald - Thompson, Richard Eubanks, 3727 W. Sixth Street, Los Angeles 5, Calif. Dunkirk 7-5391

SAN FRANCISCO
McDonald-Thompson, Morton McDonald, 625 Market Street, San Francisco 5, Calif. Yukon 6-0647

CHICAGO
122 So. Michigan Ave., Chicago 3, Ill.

FORT LAUDERDALE
E. L. Neff, 2808 Middle River Drive, Fort Lauderdale, Florida. LOgan 6-5656

Please address all mail to: AMERICAN PERFUMER AND AROMATICS, 48 West 38th St., New York 18, New York, U.S.A.

JAMES H. MOORE, Jr. *President*
M. G. DE NAVARRE *Technical Editor*
WM. LAMBERT *Editor*
JOHN H. MULLER *Vice President and Business Manager*
WALTER M. BONE *Assistant Editor*
A. van der SHAW *Art Director*
WINSTON H. REED *Aerosol Editor*
ROBERT E. SANFORD *Circulation Director*
MARY HARRIS *Advertising Production Mgr.*

PUBLISHED MONTHLY by Moore Publishing Company, Inc. Publication office: Emmett St., Bristol, Conn., U.S.A. Editorial and Executive Offices: 48 W. 38th St., New York 18, N.Y. J. H. Moore, Jr., President; Harold W. Springborn, Vice President; G. R. Brennan, Secretary. Subscription Rates: U.S.A., Possessions and Canada, $5 one year; 50¢ per copy. Foreign, $15 one year. Entered as second class matter, January 12, 1950, at the Post Office at Bristol, Conn., under act of March 3, 1879. Moore Publishing Co., Inc., is publisher also of Gas Age, Gas Appliance Merchandising, Industrial Gas, LP-Gas and Brown's Directory of American Gas Companies.
(Cable Address: Robinpub, N. Y. Volume 73, No. 1.

Copyright 1958, Moore Publishing Co., Inc.)

Clean Cut Responsibility—

It is not the iniital but the repeat sale that represents the life-blood of almost any product.

Usually, the glamour boys take all the bows when a product goes up and up to greater sales volume.

Yet, no matter how functionally or dramatically packaged, how brilliantly advertised or marketed, it is the product-content that holds the key to the repeat sale over the long run.

Simply, it is a question of how well and how long does the product stand up under use. If it rates high in that respect, the repeat sale is closer to consummation.

The responsibility is clear cut. It rests with the technician who must find the answers to better product performance, to longer shelf life in the test tubes of his profession.

The latest pin-pointed guidance the world has to offer in this highly critical area of research and study is as close at hand as page 19 of this issue, where you will find the first installment of "PRESERVATION and ANTIOXIDANTS". The second and final installment will appear in February.

"PRESERVATION and ANTIOXIDANTS" consists of some twelve chapters in all; each chapter devoted to some particular phase, each by a recognized authority in the field.

In publishing our current series of documentaries, we like to feel that we are adding greatly to the "shelf life" of the American Perfumer and Aromatics because of the extensive "how-to" reference value each contains for our readers.

The two-part "PRESERVATION and ANTIOXIDANTS" will be reprinted in full, as were "Cosmetic Emulsions" from our June issue and "The Commercial Surfactants" from our October issue, to take care of the demand for extra copies.

James H. Moore, Jr.
Publisher

Production

Cosmetic Research

Creative Perfumer

Perfume Evaluation Board

Aromatic Production

Sales

Chemical Engineering

Aromatic
Chemical Research

Quality Control

People...

THE IMPORTANT INGREDIENT

A successful perfume is the result of the abilities of the many *experienced people* who have an important part in its creation, testing, evaluation and production.

Cosmetic Research

Before a fragrance is recommended to a VAH customer, it is thoroughly tested *in product* by these expert technicians. They have at their disposal a complete modern laboratory equipped to produce any type of functional cosmetic, toiletry or aerosol product. Here, the fragrance is checked for technical suitability to the physical and chemical characteristics of the product, the process and the package. The specialized technical know-how of these people is an important ingredient in the perfume that VAH offers for your product.

van Ameringen-Haebler, Inc.

521 WEST 57th STREET · NEW YORK 19, NEW YORK

van Ameringen-Haebler, S.A.R.L.
Courbevoie (Seine), France

van Ameringen-Haebler, Ltd.
Toronto, Canada

QUESTIONS & ANSWERS

1314: HAIR COLOR RINSE

Q. *We would like to avail ourselves of your offer regarding suggestions for the ordinary hair color rinse and would be pleased if you could help us. We especially want one that when applied to the hair after shampooing does not rub off on pillows or linen. N. L. O., Australia.*

A. We are pleased to give you two formulas for hair rinses, black and platinum taken from the formulas supplied by Florence Wall, page 487 of "Cosmetics: Science and Technology." Other formulas are given in this book, and we respectfully suggest that you obtain a copy of it to give you the widest, basic understanding of hair coloring.

Black

Ext. D&C Red No. 1	22%
D&C Brown No. 1	18%
D&C Black No. 1	60%

Use 14 grams per pound acid mix.

Platinum

D&C Violet No. 1	100%

Use 2.5 grams per pound acid mix.

The acid mixture may consist of any combination of citric, tartaric or adipic acids, preferably in the anhydrous stage, or if put into aqueous solutions, you may also use lactic and phosphoric acids. The amount of color then would be used in proportionate amounts to the acid present.

1315: MILK BASE LOTION

Q. *Two or three months ago you made a comment in "Desiderata" which aroused my interest in a product. You made mention of the rolling massage cream which you manufactured back in the twenties. We would like to develop not a cream but a creamy lotion which would have the rolling massage effect. I wonder if you could give a few suggestions that may come to your mind as a starting point for developing this type of lotion. We have experimented with such a lotion which was heavily loaded with wax. Our thought is that we would like to get into one that uses a milk as a base. You mentioned that you had made your rolling massage cream, and we wonder if it could be modified so that a creamy lotion could be made up with it and have a similar effect. C. D., New York.*

A. At the moment, we do not see how you can use milk as a base for the type of lotion you mention. Perhaps the only way you could do it would be to use skim milk as a diluent in place of part of your water. Even that might upset your waxy emulsion. As you know, casein is precipitated from skim milk and this forms a basis of a solid product which while called a cream, is really a paste. We do not see how you could make a liquid emulsion with this precipitated casein unless it were put back into solution by means of some alkali. Some such soluble caseins are available for what they are worth.

From time to time suggestions have been and will be made in this magazine with respect to processes, devices, materials, appliances, equipment and the like. It is not practicable for the writers and editors to have a patent search or examination made in connection with each such suggestion. Our readers are, therefore, requested and indeed urged to determine for themselves whether any patent or other right will be violated before acting on any such suggestion.

AMERICAN AROMATICS

• *Perfume Compositions*

• *Essential Oils*

• *Aromatic Chemicals*

24 East 21st Street, New York 10, N.Y. • GR7-6313

OLAK'S RUTAL ORKS INC., MIDDLETOWN, N.Y.

AMERSFOORT, HOLLAND · PARIS, FRANCE · BREMEN, GERMANY · BRUSSELS, BELGIUM · SOFLOR LTD · PERIVALE, ENGLAND

Once in a Blue Moon...

*Once in a blue moon a really fragrant synthetic arrives— Lilial**—*Givaudan's contribution to floral naturalness! Lilial*—a pure aldehyde with an intense and diffusive note that recalls linden blossoms, with the emphasis on fragrance, represents a new high for synthetics in perfume elegance.

Lilial has remarkable tenacity and lends unmatched floralcy, intimate warmth and unique naturalness to almost any composition. On a perfume blotter it lingers for more than a month.

Unusually stable in soap, *Lilial* is long-lasting and diffusive. It is available in quantity—at a moderate price. No one synthetic has ever presented more desirable qualities to the perfumer.

Samples and technical data are available upon request.

*Reg. U. S. Pat. Off.

GIVAUDAN-DELAWANNA, INC.

321 West 44th Street
New York 36, N. Y.

LAST MINUTE NEWS . . .

Warner-Lambert Merger with Tobacco Company Collapses

The proposed merger of the R. J. Reynolds Tobacco Co. and the Warner-Lambert Pharmaceutical Co., details of which had been furnished by both companies has been called off on account of disagreements on certain aspects of merger which was to have taken place this month. Plans for the merger were under consideration by both companies since last August. The collapse of the merger came as a surprise to the drug and cosmetic industries as many of the details had been made public. A joint statement by Elmer Bobst, chairman and Alfred Driscoll, president of Warner-Lambert Pharmaceutical Co. and John C. Whitaker, chairman of Reynolds Tobacco Co. follows: "Following several months of study the managements of both companies although having developed a high regard for each other, concluded that since it did not seem possible to reach agreement on certain important aspects of the proposed transaction, not to proceed further with the discussions. Accordingly they have been amicably terminated." Officials of both companies declined to amplify what aspects of the proposed merger led to the decision.

Quality Brands Assn. Aims to Correct Commercial Evils

A new non-profit organization, Quality Brands Assn. of America, Inc. has just been formed for the purpose of stimulating the correction of commercial evils which tend to interdict and destroy the value inherent in branded quality merchandise and also to teach lawful methods of protecting the public against all things that stifle incentive to increase product values and enhance distributive services. John Anderson, president of the Anderson Co., Gary, Ind. was one of the incorporators. Officers will be announced later. The association will have offices in New York and Washington.

Toni Co. Enters Hair Accessories Field

All hair accessories needed by a woman to care for and style her hair at home will be provided by the Toni Co., Chicago, Ill. one of the foremost hair products manufacturers. A complete line of hair care and styling items is to be introduced next month on a national scale following an eight months market test in the midwest area. The line includes hair brushes, combs, nets, bobby pins, barrettes, head bands and an assortment of curlers for modern hair styles. The Toni hair assessories line is a completely self contained, self service department requiring a minimum of floor space for merchandising. Other products manufactured by the company for home hair care include home permanents, shampoos, creme rinses, curlers and a hair spray. In addition it also markets a lotion-cream deodorant and a facial cleansing lotion.

Bill to Establish Tolerances for Color in Congress

A bill to amend the Food, Drug & Cosmetic Act to give the Food & Drug Administrator authority to establish tolerances for colors is to be introduced early in the coming session of Congress. This came about as a result of the decision of the U.S. Supreme Court which established the doctrine that a dye to be used in foods must be harmless per se and not harmless under conditions of use. The case involved F D & C Red No. 32 used chiefly as a coloring matter on oranges. This dye was removed from the certified list for foods and subsequently the Florida Orange Growers brought suit on the grounds that the Administrator had authority to establish limits and tolerances and did not of necessity have to completely decertify a color found to be harmful when fed to animals in large quantities. The court, as pointed out by the Toilet Goods Assn. in its analysis of the case, upheld the position of the Administrator.

Colgate-Palmolive Co. to Purchase Wildroot Co.

An agreement in principle has been reached for the Colgate-Palmolive Co. to acquire the Wildroot Co. early in 1959. Subject to various conditions which are expected to be met within the next few weeks, all outstanding shares of stock in the Wildroot Co. are to be exchanged for Colgate stock. It is expected that the transaction will be consummated on completion of the Wildroot year end audit. The number of shares of Colgate stock to be issued for Wildroot stock has not yet been determined but will be based largely on Wildroot's net assets as of December 31, 1958. The Wildroot Co. has its plant and offices in Buffalo, N. Y.

New Foods May Be Packaged in Metal Collapsible Tubes

A survey of food executives in key companies by the Collapsible Tube Manufacturers Council indicates definite interest in packaging foods like meat, fish, cheese spreads, condiments, jelly, toppings, soup and coffee concentrates in metal collapsible tubes.

Max Factor & Co. to Celebrate Its Fiftieth Anniversary

The tiny company which was founded in a little store in downtown Los Angeles in 1908 by Max Factor, and has since mushroomed into an international organization that distributes its products in 106 countries with branch manufacturing plants in 14 of them will be fifty years old February 15. The company is planning a year long celebration of the anniversary. Max Factor Sr. who was born in Lodz, Poland came to the United States in 1904 with his family and nine days after his arrival opened a perfume, make-up and hair goods concession at the Louisiana Purchase World's Fair in St. Louis, Mo. In 1908 the family moved to Los Angeles where Mr. Factor opened a theatrical make up and hair goods shop for actors. January 2, 1909 the Max Factor & Co. business was officially founded. With the advent of the movies there was a much increased demand for Factor products and the business thrived. The company was incorporated in 1929. The innovations introduced by Mr. Factor and later by his company with the help of his sons are too numerous to list but they make an impressive row of milestones in the development of the cosmetic industry.

Conference on Hair Growth and Regeneration January 31

A conference on hair growth and hair regeneration is to be held under the auspices of the New York Academy of Sciences Section of Biological and Medical Sciences at the Barbizon-Plaza Hotel, 101 West 58th St. New York City January 31. Dr. Irwin I. Lubowe of the New York Medical College is conference chairman. The session chairman is Dr. William Montagna of Brown University. The Section provides conferences for active workers in the special fields of biology and medicine. Attendance is limited to those invited to participate in the conferences and to interested members of the Academy. The program follows: Greetings from the Academy, Robert L. Kroc, chairman of the Section. Opening remarks will be given by Dr. Irwin I. Lubowe, New York Medical College and Dr. William Montagna, Brown University. Papers to be presented are: "Growth of Hair Follicle, Herman B. Chase, Brown University; Restitutive Growth in the Hair Follicle of the Rat, Dr. Earl Butcher, New York University; The Occurrence of Trytophan Metabolites in Hair and Feathers, Gerbert Rebell and T. D. Fitzpatrick, Colgate-Palmolive Co.; Recent Results on the Fine Structure of Hairs and Hair Follicles, George E. Rogers, Wool Textile Research Laboratories, Victoria, Australia; The Innervation of Hair Follicles, Richard K. Winkelmann, Mayo Clinic, Rochester, Minn.; Newer Findings on the Proteins and Enzymes of Hair Follicles, George E. Rogers, Victoria, Australia. Two papers will cover pattern alopecia: General Aspects of the Problem of Baldness, James B. Hamilton, State University of New York; and Histological and Histochemical Changes in Baldness, Richard A. Ellis, Brown University. Alopecia Areata will be covered by three papers: Clinical Aspects, Dr. Irwin I. Lubowe, New York Medical College; Autografts in Alopecia, Norman Orentreich, University Hospital, New York; and Interpretations of the Problem, Eugene J. Van Scott, National Cancer Institute, Bethesda, Md. Neogenesis of Hair Follicles in Adult Men will be covered by three papers: Neogenesis in the Antlers of the Deer, Robert Billingham, Wistar Institute, Philadelphia; Neogenesis in Rabbit Wounds, William Straile, Brown University; and Neogenesis in Human Skin, Albert M. Kligman, University of Pennsylvania Hospital. Dr. William Montagna of Brown University will summarize the conference.

Founded 1889 by Aloïs Von Isakovics

Perfumes Especially for Aerosols

The solution to your perfuming problems with aerosol products is now at hand in the newly developed series of *Synfleur* AEROSOL PERFUME OILS.

Designed to meet the needs of the specialties manufacturer for lotions, insecticides, rug cleaners, etc., this new series is equally suitable for the perfume, cologne and toilet water manufacturer.

Absolutely non-clogging, non-corrosive, completely compatible and soluble, the new *Synfleur* perfume oils can be used safely with any type of packaging or container.

Take advantage of the entire range of formulation and packaging possibilities opened to you through this *Synfleur* development. *Write today for complete information and data applicable to your products.*

Synfleur SCIENTIFIC LABORATORIES, INC.
MONTICELLO, N. Y.

ATLANTA • DETROIT • LOS ANGELES • NEW YORK • SAN FRANCISCO • MEXICO, D. F. • HAVANA • MONTREAL • Guatemala City • San Salvador • San Pedro Sula
Managua • San Jose • Panama • Barranquilla • Medellin • Bogota • Caracas • Maracaibo • Rio de Janeiro • Buenos Aires • Santiago

New York Sales Office: Telephone Plaza 7-1960

FOR THE RIGHT MANUFACTURER OF A QUALITY LINE OF COSMETICS, WITH AN EYE TO OPENING UP EXPORT PROFITS . . .

A MUTUALLY BENEFICIAL ARRANGEMENT CAN BE WORKED OUT!

We are a large, well known Western Germany manufacturer of top quality soaps, etc. We are uniquely flexible and qualified to take on the distribution of a quality line of cosmetics either as direct importers or as a manufacturer on a royalty basis.

Our portion of the Western Germany luxury soap market runs approximately 70% of the annual total sales volume. We also do a very sizable and growing export business in various lucrative European countries.

The very channels of distribution in which we are so well established also predominantly account for the sale of quality perfumes and cosmetics. Our handling of a complementary line of fine American cosmetics is bound to work to our mutual advantage.

We urge you to investigate.

MÄURER+WIRTZ

STOLBERG IM RHEINLAND
GERMANY/ALLEMAGNE

KNAPP FINE CHEMICALS PRODUCTS INC.
LODI, NEW JERSEY

- **EMULSIFIERS**
- **DETERGENTS**
- **ABSORPTION BASES**
- **FRAGRANCES**
- **SCIENTIFICALLY DEVELOPED AND MANUFACTURED— SPECIFICALLY FOR APPLICATION IN COSMETIC FORMULATIONS**

KNAPP FINE CHEMICALS PRODUCTS INC.
LODI, NEW JERSEY

MARYLAND GLASS DESIGNERS USE THE MICROMETER FOR PRECISION ACCURACY...

BUT ESSENTIALLY

Package design begins with an idea

Every craftsman knows his tools, but the creative package designer must do more—first he must bring an idea to life. An idea that says Yes to questions like: Is this container distinctive? Will it sell on the shelf? Does it pack properly, ship safely? Our design department specializes in designs that stop the eye . . . start the sale. For an affirmative solution to your design problems, contact Maryland Glass Corp., 2147-53 Wicomico St., Baltimore 30, Md.

STOCK DESIGNS— A variety in blue or flint glass . . . in a complete range of sizes . . . is ready for immediate shipment.

PACK TO ATTRACT IN MARYLAND GLASS

Blue or Flint • Jars and Bottles

Announcement is made that

van Ameringen-Haebler, Inc. of New York and Polak & Schwarz N. V. of Zaandam, Holland

have combined their interests and will operate as divisions of a New York parent company to be known as

International Flavors & Fragrances Inc.

The identities of these two long-established firms will be retained and each will continue to serve its customers in the same manner as in the past.

By operating in conjunction with each other, they will have development, manufacturing and distributional facilities in fifteen countries, through wholly-owned subsidiaries in North and South America, Europe, the United Kingdom and South Africa.

As a result both firms will be able to supply their products and services on a greatly expanded and more effective basis.

van Ameringen-Haebler
A Division of International Flavors & Fragrances Inc.
521 West 57th Street
New York 19, N. Y.

Polak & Schwarz International N.V.
A Division of International Flavors & Fragrances Inc.
Zaandam
Holland

Creators and Manufacturers of Flavors, Fragrances and Aromatic Chemicals

DESIDERATA

Maison G. deNavarre, M.S., F.A.I.C.

Sterilizing with Gas

We had hoped to have a paper in our spoilage study on sterilization of powered or granular cosmetic materials, closures or containers with gas. The paper was to have been prepared by Dr. Lloyd A. Hall, but Dr. Hall had to beg off at the last moment, due to pressure of other activities. Maybe later we can have his contribution.

Formaldehyde and sulfur dioxide were the gas sterilizers I remember, after someone in the family had Chicken Pox or the Measles or other infectious diseases.

Today it is ethylene oxide. It does a good job, too. Hall has shown that black pepper, for example, has over 4,000,000 organisms per gram before treatment which can be reduced to 18,000 after treatment. The mold count in the pepper was 1,500 before treatment and zero after treatment. Since the microbial count of the raw materials is important in preservation, it is easy to see where gas sterilization can work out in cosmetic practice.

One of the easiest ways to reduce the microbial count in closures is by means of gas. It is the only thing that can penetrate the backing and facing.

Documentaries

If you like our presentation of various subjects as documentaries, let us know. The current one on spoilage covers both microbial spoilage and oxidative rancidity, divided into two issues of the magazine.

Our previous one covered the important surfactants usable in cosmetics. Before that we had one on emulsions and emulsifiers.

We have another one on the fire for May. Can't tell you what it is, but we hope you like it. As in all the previous ones, the next will have contributions from experts in this country and abroad. That way you get the whole picture.

So, please drop us a line and tell us if we should continue them.

Hair Spray Safety

Although the paper seemed to drag unnecessarily, the address by Calandra and Kay on the "Effects of Chronic Inhalation of Hair Sprays in Experimental Animals," was a joy to hear. The work seemed thorough, though one control, the completely untreated group, didn't seem to be sufficiently stressed.

The experiments were rigid and drastic. The results could not in any way point to two different hair sprays, a PVP/VA and a shellac type, as causing any changes in the major organs of the animals tested that did not appear in control groups.

FDA Commissioner Larrick described results of FDA tests on aerosol hair sprays at the CSMA meeting, the indication being that they are apparently safe under conditions of use. The Commissioner commented that had the products been tested in advance, that the situation would have been different.

Maybe he is right. The subjects reported by Bergman seemingly did not use the hair spray as it was intended to have been used.

No matter what animal tests show, they still prove only that the results are valid for the conditions of test and on the test animal.

Bergman's report as do so many in the medical literature, points up the fact that consumers do not pay enough attention to labelling. And I, for one, don't know how to make them read directions before use.

Many home accidents occur with children who either cannot read or to whom directions are meaningless. Hazardous articles legislation doesn't solve *this* problem. A child eats his mother's lipstick; another drinks her nail polish or cologne. How does legislation or labelling prevent this hazard?

Notes

One suspects the hand of Dr. Edward J. Masters of Helena Rubinstein in the very clever advertisement of their estogen-progesteron cream appearing in the recent (November) issue of the *Journal of the American Medical Women's Association.* It is very ethically done. Though it was an editorial before I hit the second last paragraph . . . . . Daley's comparison of zirconium oxychloride to sodium zirconium lactate at the recent meeting of the T. G. A. Scientific Section was missed by some people. It was good. Too bad his slide got mixed up . . . . Incidentally, when Steve Mayham and Helper were making off with (I mean transferring) the cash box, the situation looked like an Alfred

IN THE THICKET OF INDUSTRY...

the best approach to penetrating any *one* market is by concentrated, pin-pointed sales effort.

To sell the cosmetic industry you need but rely on the *penetrative* power of the American Perfumer and Aromatics.

As the only publication devoted exclusively to the cosmetic industry, the American Perfumer and Aromatics has long been attracting and holding to its editorial pages people of identical interests, occupation and devotion.

If it has an application to improving the production, or the quality or packaging of cosmetics, it best be advertised in the American Perfumer and Aromatics.

AMERICAN PERFUMER
AND AROMATICS

48 West 38th St. • New York 18, N. Y.

Hitchcock TV show, but we all know Steve had nothing but business-like and cooperative motives in "closing the store." . . . . . Someone should get to Dr. Stephen Darling at Lawrence College Chemistry Department in Oshkosh, Wisconsin, and put him straight on cosmetic costs . . . he is periodically talking to women's groups and telling them how much fat there is in the cosmetic business because he can make a jar of cream for 2 cents for material plus 10 cents for container that sells for $1.50 to $35.00. He thinks this is a 'comfortable margin" to work on . . . . . Upjohn are pushing their Neomycin for use in deodorants and anti-perspirants. . . . My grateful thanks to all who sent Holiday Greetings. I reciprocate them most cordially. . . . The Schaar laboratory supply company in Chicago is selling a pH Calculating slide rule devised by Norman Joseph and described in *Science* for November 14, 1958. Both pH and pK can be calculated quickly once one set of data are known. . . . The German supplier, Grunau A. G., sell a sodium and a triethanolamine solubilized albumin hydrolysate for use in shampoo and other cosmetic preparations. . . . Both Sfiras and Demeilliers have done another good digesting of cosmetic advances in the current issue of *Recherches*, a Roure DuPont house organ.

. . . Sulfonated tallow acids that can be alkali neutralized show possibilities as detergent bar bases have been developed at the Eastern Regional Research Laboratories of the Department of Agriculture in Philadelphia. . . . Wonder when a detergent bar using a "quat" germicide as the active ingredient will be made as a deodorant bar? . . . There are indications that sorbic acid, sometimes recommended as a preservative can cause skin reactions in concentrations as low as 0.025 per cent according to Fryklof.

SEMI-ANNUAL EDITORIAL INDEX NOW AVAILABLE

The semi-annual editorial index of AMERICAN PERFUMER AND AROMATICS for the period from July 1 through December, 1958 is now available. Copies can be obtained without charge by writing to:

AMERICAN PERFUMER AND AROMATICS
48 West 38th Street
New York 18, N.Y.

ONE Name Stands Out!

California's Golden Gate Bridge

Completed in 1937, this, the world's longest suspension bridge, has a channel span of 4,200 feet. Here you see it from the San Francisco end. In the foreground is deserted Fort Point.

And . . . . . in NATURAL and AROMATIC MATERIALS, BASES and SPECIALTIES for Perfumes, Cosmetics, Soaps and Aerosol Dispensed Products it's

Tombarel

American Representatives for
TOMBAREL FRERES, S.A., Grasse, France
IMAGINATION • SKILL • RESOURCE

Tombarel 1937-1959

PRODUCTS CORPORATION
725 Broadway, New York 3, N. Y.

CHICAGO
A. C. DRURY & CO., INC.
210 East North Water Street

FRAGRANCE PLAYS A FEATURE ROLE

Whether fragrance plays a bit part or one that's "up in lights" on your advertising marquee, it plays a feature role in your every product from lipstick to toilet water, from cleansing cream to bath powder. On its performance can depend the success or failure of that product.

As producer, give us the opportunity to serve as your fragrance casting director. Let us in on the act from the beginning. Let our experience dictate a dramatic fragrance choice for you. Or let us custom-create the fragrance compatible with your entire cast of ingredients.

We can help you get the critics' raves; assure you of good box-office; make your product a *tour de force!*

CRITICS' CHOICE

Tibetole

Critics acclaim our **New** artificial musk, **TIBETOLE**, the best understudy of the current perfumery season. Its performance matches in every detail that of the finest musk tonquin tincture: in **true** animal-note character; in **potency**; in **effectiveness** in perfumes and colognes; in **stability** and **persistence** in soap and cosmetic preparations.

The one and only way you can distinguish **TIBETOLE** from the original is in price. Needless to say, it is vastly less expensive. And, of course, ready "on cue" at all times. Call or write for an audition (trial sample) of **TIBETOLE.**

"to get your show on the road", consult:

COMPAGNIE PARENTO, INC.

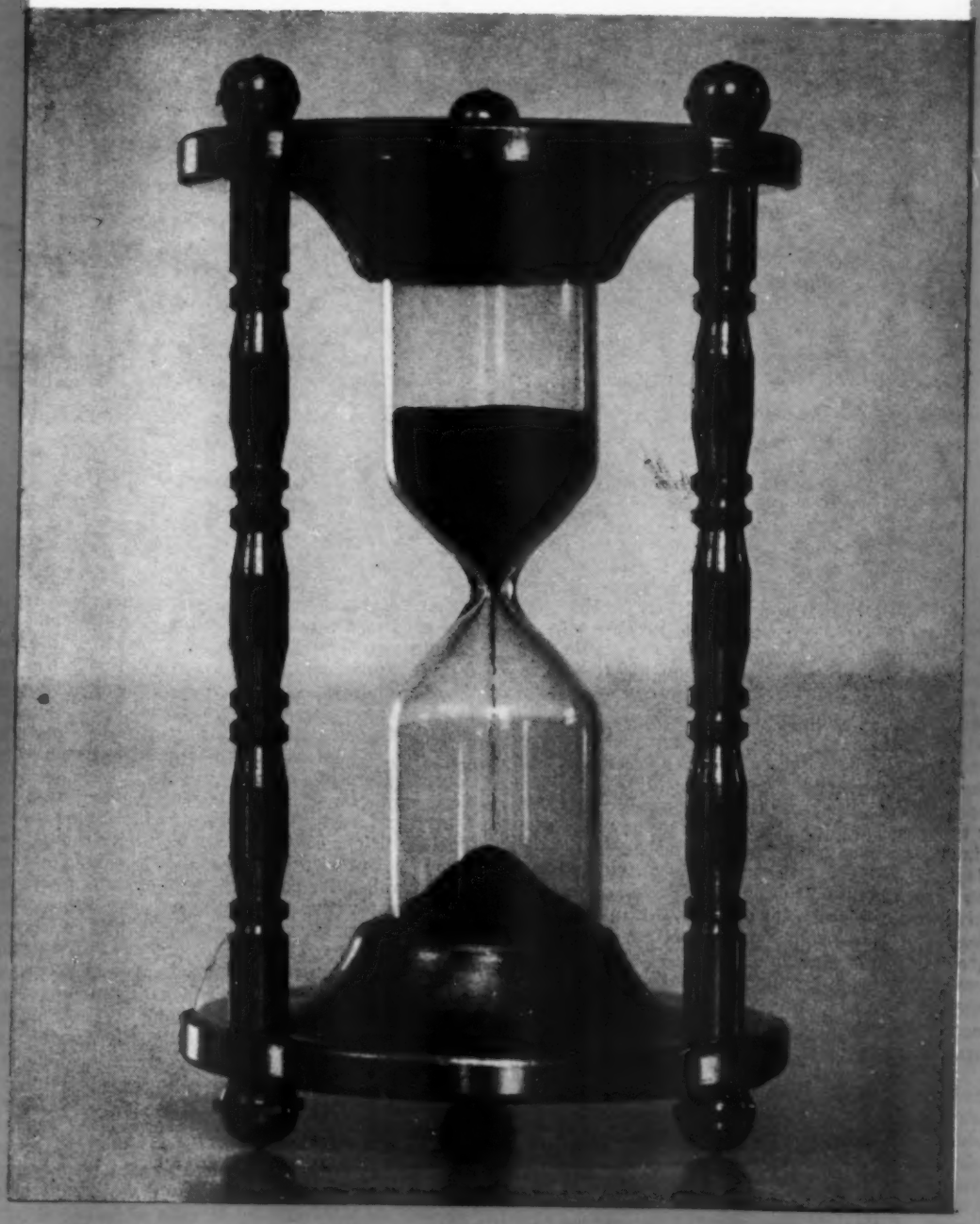
CROTON-ON-HUDSON, NEW YORK

New York Office: 507 Fifth Avenue — Phone: MUrray Hill 7-5133

COMPAGNIE PARENTO, LTD. • 73 Adelaide Street West, Toronto 1, Ontario, Canada

ESSENTIAL OILS • AROMATIC CHEMICALS • PERFUME BASES • FINE FLAVORS

PART I • TO BE CONCLUDED IN FEBRUARY ISSUE



PRESERVATIVES & ANTIOXIDANTS

M. G. deNAVARRE

In continuing this series of documentaries, we look at the problem of spoilage—spoilage due to microbial growth as well as oxidative rancidity.

Again we have been fortunate to obtain articles from highly qualified foreign and domestic workers in these fields. It is hoped that their contributions will help the reader in preventing spoilage of his products.

FACTORS TO BE *in the* OF COSMETIC

LINWOOD F. TICE and MARTIN BARR
Philadelphia College of Pharmacy and Science, Philadelphia 4, Pa.

The preservation of an emulsion, whether it be a cosmetic or a pharmaceutical, can be and often is a very complex problem. It is the purpose of this paper to outline briefly some of the factors which must be considered in selecting a suitable preservative and in predicting its satisfactory performance.

Preservation in the sense that it is used in this paper refers to restraining the growth of various microörganisms including bacteria, yeast and molds. It does not include steps taken to prevent purely physical changes such as "creaming" or the use of antioxidants to retard oxidative rancidity and color changes. Such physical and chemical alterations can, of course, occur by reason of changes induced in a product as the result of enzymes elaborated by microörganisms in their process of growth. It is for this reason that an emulsion giving evidence of growth of some microörganism often exhibits its physical changes in the product as well.

Emulsion Type

The preservation of an oil-in-water emulsion is more necessary and important than that of the water-in-oil type. In the latter case (w/o), oil is the external and continuous phase. As such, it more or less effectively blocks entry of contaminating microörganisms into the aqueous phase. Even if contaminated, the spread of microörganisms throughout the product is mechanically hindered, hence visible growth is not often seen. Spores falling on the surface of such a product, while not killed, find themselves in an essentially arid environment which is not conducive to growth.

Many cosmetic products consisting of water-in-oil emulsions have been distributed without the use of a preservative but it is probably best to use one. If the oils comprising the external phase are natural fats, it is quite important since oxidase enzymes produced by even slight growth of organisms can cause rancidity and even color changes.

Effect of Various Ingredients

It frequently happens that some ingredient in a cosmetic formula is itself bacteriostatic and fungistatic. The finished product as a result does not require an added preservative. Many such compounds are known and used medicinally but, in the cosmetic field, they are few in number. For example, aluminum or zinc salts used in an antiperspirant cream will themselves restrain most organisms. Some perfume ingredients conceivably might have a preservative action but usually they are employed in too low a concentration to function effectively. Alcohol is a good preservative when used in a concentration of about 12-15 per cent calculated on the basis of the aqueous phase. Most but not all organisms are restrained by this concentration. Some pharmaceutical emulsions contain alcohol used for this purpose but this is not practical in the case of cosmetic emulsions.

Glycerol, quite contrary to common opinion, is not a good preservative. In fact, most organisms can utilize it as a nutrient and grow on its solutions profusely. Only when glycerol is present in very high concentration does it restrain their growth. It then does so purely by reason of its osmotic effect, dehydrating the organisms present so that they cannot multiply. The concentration required to do this is about 40-50 per cent—far above what would be practical in a cosmetic. Propylene glycol, on the other hand, while not as useful a humectant as glycerol or sorbitol, has an inherent toxicity for microorganisms by reason of its free methyl group. Thus, it behaves much like ethyl alcohol and 15-20 per cent will restrain most microörganisms. It is interesting to note that the same organism that shows considerable tolerance to alcohol—namely, *Monilia albicans*—shows a similar tolerance to propylene glycol (1).

Sodium lauryl sulfate, while generally used as a surfactant, is inhibitory to many organisms. This is not surprising in view of its irritating action on tissue, a property which led to its replacement in Hydrophilic Ointment U.S.P. with the nonionic surfactant, Polyoxyl 40 Stearate. Nevertheless, a cosmetic manufacturer by replacing this substance with some other in a formula quite conceivably might find that the new product required a more effective preservative by reason of the absence of sodium lauryl sulfate. Not only do anionic surfactants like sodium lauryl sulfate have a direct action on many microörganisms but they often potentiate various antiseptics such as the phenols.

Various quaternary ammonium salts such as benzalkonium chloride are sometimes used as preservatives and, under certain conditions, these can be quite effective. It must be remembered, however, that these com-

*Reprinted from the Journal of Society of Cosmetics Chemists, 9, No. 3 (1958)

CONSIDERED PRESERVATION EMULSIONS*

pounds are cationic and the inclusion of any anionic material in a product preserved with them will neutralize their antiseptic action and leave the product completely unprotected. While this might be anticipated with some anionic surfactant, other anionic substances like the acid dyes (used as sodium salts) do the same thing. In such instances, not only is the preservative action of the quaternary ammonium sale neutralized but some of the dye is usually precipitated from solution changing the color of the finished product.

Effect of pH

As is very well-known, the pH of a product has a considerable influence not only on what microörganisms are most likely to grow but also on the effectiveness of various preservatives. Generally speaking, bacteria are inhibited below pH 4 and prefer a nearly neutral medium. Yeasts and molds grow best in a slightly acid medium, although some can adapt themselves even to an alkaline medium. A product inoculated with both mold and bacteria will usually permit one or the other to grow out depending on the pH. For example, a gelatin solution will only mold at pH 3.5 but putrefy through bacterial growth at pH 6.0-7.0 when subjected to mixed air contaminants. ...

Emulsions containing alkali metal soaps are too alkaline for most organisms to grow in them. Soap as a chemical is inhibitory to growth as is sodium lauryl sulfate. The amine soaps such as triethanolamine oleate are less alkaline and an occasional product made with such soaps may cause difficulty through spoilage.

At the pH level of most modern cosmetic creams and lotions, growth of bacteria, yeasts and molds is possible; effective preservation is both indicated and necessary. Many common preservatives are of very poor efficiency at certain pH ranges. For example, benzoic acid is practically useless at a neutral pH and its effectiveness rises rapidly as the pH drops. For products having a pH between 5 and 7, it is too poor a preservative to be useful. At pH 3.0, it will provide protection against most molds, and bacteria are already inhibited by this degree of acidity. Sorbic acid is also most effective at an acid pH but it still retains activity at a useful pH range such as 4.5-5.0. The quaternary ammonium antiseptics, on the contrary, are most favorable in their action somewhere near a neutral pH, although their efficiency is not quite as dependent on the pH as that of benzoic acid.

Other Factors

Some factors which are less tangible but just as important in determining effective preservation deserve some consideration. One frequently overlooked is the nutritive quality of the product to be preserved. Obviously, it is easier to preserve ordinary water than it is an excellent nutrient like bouillon or some other culture medium. Cosmetic products range between these extremes with each and every water-soluble or water-dispersible ingredient adding to or detracting from the tendency of the product to support growth. Not only does the quality of the product as a nutrient influence growth, it also influences the relative ease or difficulty of preservation. A cosmetic product barren of all potential nutrient is much easier to preserve, all other things equal, than one containing a nutrient. A nutrient-free product is not easy to achieve when one considers the wide diversity of substances on which organisms can grow but some cosmetic ingredients are much better nutrients than others.

Another very important factor is the type of organism, its strain, and numbers in the contaminating inoculum. There is an almost unbelievable variation in different microörganisms as to their ability to grow in a given product even when preserved. Though tested exhaustively in the laboratory using known organisms and the usual air contaminants, there can be no guarantee that some jar of the product will not eventually be contaminated with some organism or new strain against which the preservative is ineffective. An experience of the authors will serve to illustrate this. In searching for a suitable preservative for ophthalmic solutions, the problem is to find something that can be tolerated by the eye but which will kill (not inhibit) *Pseudomonas aeruginosa*. This contaminant can cause corneal ulceration and blindness in a patient using a eye solution. The authors found—among all substances tested—that polymyxin B sulfate 500 units/ml. was the only one that was effective. As a final check, 21 different strains of this organism were collected from various laboratories and hospitals. Twenty were readily killed by 500 units/ml. of the antibiotic. The remaining strain was not affected by 2000 units/ml. This same phenomenon can occur in preserving a cosmetic. This accounts for the sporadic spoilage reported in the field when control samples of the same lot and others picked up on shelves are in perfect condition.

As every good production man knows, preservation will not compensate for unsanitary and careless manufacturing and packaging. It is imperative that products be made and packaged in such a way as to keep contamination at a minimum.

In testing preservatives, it is well known that the size of the inoculum often influences the result. This has both its quantitative and qualitative aspects. In some cases, the inoculum simply overwhelms the preservative as has been reported to occur with sorbic acid (2, 3). There is also the interesting possibility that the larger the inoculum the greater the chance of its containing some mutant not affected by the preservative or, at least, able to adapt itself to the unfavorable environment. It can easily be shown by animal experiment that the injection of a few virulent organisms is usually tolerated by the animal; whereas, a large number almost invariably causes illness and death.

Many products are made under sanitary and even aseptic conditions only to be packaged in nonsterile or soiled containers. Closures are also a frequent source of contamination. If liners can support growth, they may absorb moisture from the product, permit mold to grow and then allow its spores to heavily contaminate the surface of the cosmetic itself.

Products Containing Nonionic Surfactants ▶

In recent years, the numerous advantages of nonionic surfactants have led to their widespread use in many products including cosmetics. The nonionic surfactants are very versatile, have little or no toxicity and are not irritating to tissue as are ionic surfactants. They may also be used at a pH range which is physiologic for the normal skin.

Difficulty in preserving some cosmetic products, however, has been reported from time to time. DeNavarre has investigated this problem extensively and, in a series of papers, has reviewed its background as well as his own experiments (4-6). Fisher (7), as early as 1942, reported on some interference between nonionics and certain chemicals including phenol. This was followed by the report of Bolle and Mirimanoff (8) in 1950 who found that certain antiseptics, including the *p*-hydroxybenzoates, were inactivated by some nonionics.

When the formula for Calamine Lotion in the *United States Pharmacopeia XIII* was changed in the Fourteenth Revision, an interesting problem arose. Bentonite Magma, which had been used as the suspending agent for a number of years, was replaced with a mixture of polyethylene glycol 400 monostearate, as a suspending agent, and polyethylene glycol 400. These gave a fine, smooth homogeneous product but, when it was phenolated by the addition of 1 per cent liquefied phenol to prepare Phenolated Calamine Lotion official in the *National Formulary*, the lotion separated due to the incompatibility of the nonionic suspending agent and the phenol. This was still another evidence of the incompatibility of nonionics and phenols.

The attention of the present authors was drawn to the problem of preserving products containing nonionic surfactants in their work with the newer pharmaceutical ointment bases and their development of the present *U.S.P. XV* product, Hydrophilic Ointment. This is an oil-in-water emulsion using Polyoxyl 40 Stearate U.S.P. as a surfactant. Hydrophilic Ointment U.S.P. is effectively preserved with a mixture of 0.025 per cent methylparaben and 0.015 per cent propylparaben. The contribution to preservation made by the 12 per cent propylene glycol present as a humectant should not be overlooked, however. If the propylene glycol were absent, it is possible that the product would spoil.

The research done by the authors on the basic problem of preserving products containing nonionic surfactants has been reported in two papers (9, 10). Some of the findings will be discussed here since they have certain practical applications.

Figure A—Preservation of o/w cold cream. All inoculated with *Aspergillus niger*. 1, Control; 2, 0.2 per cent sorbic acid; 3, 0.18 per cent methyl paraben, 0.05 per cent propyl paraben.

Working with various nonionic surfactants of the fatty acid ester type in aqueous solution or dispersion, it was shown that various organisms including *Pseudomonas aeruginosa, Aspergillus niger, Penicillium notatum* and *Monilia albicans* were capable of growing in such solutions or dispersions. Not only did they grow but, by release of esterases, they split off the fatty acid from the surfactant molecule. This is an added liability since, when so split, the hydrophilic and lipophilic portions of the molecule are separated with the destruction of surfactant properties. Work done by the authors since these papers were published has shown that the polyoxyethylene derivatives of fatty alcohols in which the hydrophilic chain is linked through an ether oxygen to the lipophilic chain are not split by the enzymes released as microörganisms grow. This was somewhat expected since an ether linkage is generally more stable than an ester linkage. Work now in progress is directed to find out whether microörganisms use the intact surfactant molecule as a nutrient or trace amounts of nutrients such as sugars or polyols present in the surfactant. The latter seems the most likely but only slight growth can give rise to a large amount of esterases. This, in the case of sorbitan esters at least, and possibly others, yields more nutrient by splitting the sugar or polyol fraction off the surfactant molecule.

The second phase of the study was an exhaustive investigation of a long series of preservatives in their effectiveness to prevent growth in a 5 per cent aqueous solution of polyoxyethylene 20 sorbitan monostearate.* This was chosen as typical of the ester type of nonionic surfactant and one containing many ether oxygens to which have been ascribed the property of complexing or at least some interaction with phenolic and other groups by several workers (11-13).

Figure B.—Preservation of o/w face cream. All inoculated with *Cladosporium* sp. 1, Control; 2, 0.2 per cent sorbic acid; 3, 0.18 per cent methylparaben, 0.05 per cent propylparaben.

Forty-eight substances and combinations were studied for their possible effectiveness as preservatives for an aqueous solution of this surfactant when inoculated with cultures of the several organisms previously mentioned. Those found satisfactory were sorbic acid, 0.2 per cent; phenylmercuric borate, 0.007 per cent; phenylmercuric nitrate, 0.01 per cent; phenylmercuric acetate, 0.007 per cent; methyl Carbitol, 3 per cent; hexylene glycol, 3 per cent; and benzalkoonium chloride, 0.1 per cent. The phenylmercuric salts are not usually looked upon with favor for cosmetic use. Therefore, sorbic acid and combinations of sorbic acid with hexylene glycol were then tested for their effectiveness in a series of cosmetic products of the oil-in-water emulsion type made with various nonionic surfactants. These products were inoculated both with laboratory cultures of various test organisms as well as cultures of organisms isolated from spoiled samples of cosmetic products. Sorbic acid, hexylene glycol and their combinations were entirely effective. The parabens in all concentrations employed were ineffective in preserving the 5 per cent aqueous solution of the surfactant. Both growth and splitting of the fatty acid from the ester was observed. Other phenols, benzoic acid and many other compounds were ineffective.

* Tween® 60, Atlas Powder Co., Wilmington, Del.

Figure C—Growth on o/w cosmetic creams made with nonionic surfactants. 1, *Cladosporium sp*; 2, *Penicillium notatum*; 3, *Aspergillus niger*.

These results parallel those reported by deNavarre (4, 5) who tested various preservatives as to their ability to preserve both Sabouraud Dextrose Agar and Jaag medium in the presence of nonionic surfactants. DeNavarre found, however, that sorbic acid was ineffective in preserving Jaag medium in the presence of nonionic agents. Since the test used by the present authors which showed it to be effective was based on a different approach, deNavarre's procedure was studied. The results obtained using Jaag medium were the same as those reported by deNavarre. The authors believe that the failure of sorbic acid to preserve Jaag medium containing nonionic surfactants, while effective in actual cosmetic products, is explainable as follows: Jaag medium is an excellent nutrient for molds and, as such, subjects a preservative to an exceedingly rigorous test. There is also a likelihood that some of the cations present in Jaag medium—namely, Mg^{++} and Fe^{++}—may precipitate or partially inactivate the sorbic acid. Some visible precipitation does occur in Jaag medium when sorbic acid is added. Lach, *et al.* (13), using polyethylene glycol have shown that p-hydroxybenzoic acid and parabens complex with it rather extensively; whereas, sorbic acid complexes only slightly or not at all. This would seem to offer a logical explanation for the failure of the parabens to preserve nonionics with a polyether chain and the success attained using sorbic acid.

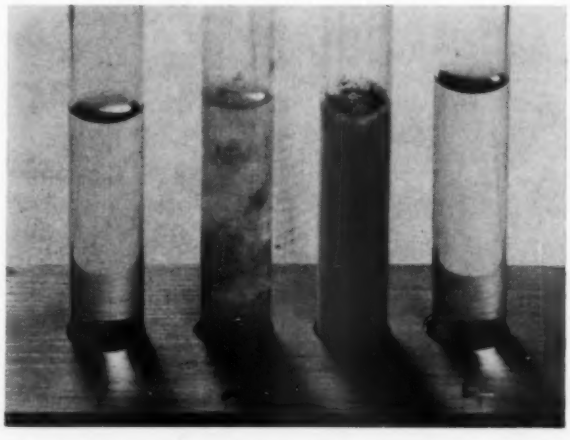


Figure D.—Splitting of ester type surfactant by *Aspergillus niger*. 1, Five per cent aqueous solution of surfactant; 2, three days after inoculation showing separation of stearic acid; 3, seven days after inoculation; 4, solution when preserved with 0.2 per cent sorbic acid, inoculated and kept 30 days.

Kostenbauder and Patel (14) recently reported on the binding of the parabens by polyoxyethylene (20) sorbitan monooleate* and showed that the methyl ester was bound to the extent of about 80 per cent and the propyl to the extent of about 95 per cent. They also showed that the solubility of the parabens was several times greater in aqueous solutions of this nonionic agent than in pure water. This suggests the possible "loading" of a cosmetic product with more than the amount of parabens usually employed as preservatives. Whether such "loading" would interfere with the surfactant in its function as an emulsifying agent is a possibility that deserves attention.

In actual tests by the authors using various cosmetic products made with nonionics and preserved with parabens, spoilage even after inoculation and exposure to air contaminants was not the invariable result. The many satisfactory practical tests observed explain why many manufacturers have used parabens successfully in cosmetics containing nonionics. The failure observed in more rigid tests such as those conducted by deNavarre and the present authors also explains the occasional failure of the parabens reported in practice.

As pointed out earlier in this paper, many internal and external factors determine whether a given product will spoil; the preservative used is only one of the many complex and interdependent variables. It is probably safe to say that the ideal preservative has not as yet been found. To be ideal, it must never fail under any and all conditions, must be odorless, nontoxic, nonirritating, nonallergenic, stable and effective at all pH levels, and relatively inexpensive.

While at first glance, the increased difficulty of preserving cosmetics made with nonionic surfactants might seem to militate against their use, their many advantages more than offset this disadvantage. At the present, it would appear that some risk is attached to the use of the parabens in such products; whereas, sorbic acid in a concentration of 0.2 per cent is satisfactory.

Sorbic acid has but little odor; it is nontoxic and accepted by the Food and Drug Administration even for internal use. Using it does not avoid the necessity of sanitary manufacturing and packaging since, with gross contamination, it too can fail. Sorbic acid acts by interference with the metabolism of fatty acids by microörganisms. With gross contamination, the usually effective level can no longer repress the dehydrogenation step involved in the process and then even sorbic acid itself is metabolized. This explains the lack of toxicity of sorbic acid since, in man, it is readily metabolized as is any fatty acid.

Preservation, like all other procedures, is beset by many complex problems. As the authors sometimes tell their students, "Beware of that which appears to be simple and elementary, for it is not the subject which is elementary but one's understanding of it."

* Tween® 80, Atlas Powder Co., Wilmington, Del.

References

(1) Barr, M., and Tice, L. F. *F. Am. Assoc., Sci. Ed.*, 46, 217 (1957).
(2) Smith, D. P., and Rollin, N. J., *Food Research*, 19, 39 (1954).
(3) Wyss, O., *Advances in Food Research*, 1, 373 (1948).
(4) deNavarre, M. G., and Bailey, H. E., *J Soc. Cosmetic Chem.*, 7, 427 (1956).
(5) deNavarre, M. G., *Ibid.*, 8, 68 (1957).
(6) Hall, C. S., and deNavarre, M. G., *Proc. Sci. Sect. Toilet Goods Assoc., No.* 27, 29 (1957).
(7) Fisher, C. V., *Am. J. Public Health*, 32, 389 (1942).
(8) Bolle, A., and Mirimanoff, A., *F. Pharm and Pharmacol.*, 2, 685 (1950).
(9) Barr, M., and Tice, L. F. *F. AM. Pharm. Assoc., Sci. Ed.*, 46, 442 (1957).
(10) Barr, M. and Tice, L. F., *Ibid.*, 46, 445 (1957).
(11) Higuchi, T., and Lach, J. L., *Ibid.*, 43, 465 (1954).
(12) Chakravarty, D., Lach, J. L., and Blaug, S. M., *Drug Standards*, 25, 137 (1957).
(13) Lach, J. L., Ravel, K., and Blaug, S. M., *F. Am. Pharm. Assoc., Sci. Ed.*, 46, 615 (1957).
(14) Kostenbauder, H. B., and Patel, N. K., "Interaction of Preservatives with Macro-molecules I," presented before the Section on Pharmaceutical Chemistry and Biochemistry, Fourth Pan-American Congress of Pharmacy and Biochemistry, Washington, D. C., November 4, 1957.

Emulsifiers

For ease of use — For dependable results —
For solving difficult problems

Tegacid...

Glyceryl Monostearate — Acid Emulsifying. For anti-perspirant — deodorant creams, lotions and ointments — all greaseless, medicated formulations.

Tegin...

Glyceryl Monostearate — Self Emulsifying. For neutral greaseless creams, lotions, ointments, suntan creams.

Tegin 515...

Glyceryl Monostearate — Non Self-Emulsifying. Used in conjunction with auxiliary emulsifiers.

Tegin P...

Propylene Glycol Monostearate — Self Emulsifying. For greaseless creams—brushless shave, foundation, suntan: lotions — foundation, suntan, ointments.

Lanolin Absorption Bases

PROTEGIN X.....ISO-LAN

For Creams, Lotions, and Ointments

• TEGOSEPT PRESERVATIVES **• ANTIOXIDANTS**

ESTERS OF PARAHYDROXYBENZOIC ACID PROPYL GALLATE ETHYL GALLATE

Goldschmidt
CHEMICAL CORPORATION

153 Waverly Place, New York 14, N. Y.

SALES REPRESENTATIVES

CHICAGO • LOS ANGELES • ST. LOUIS • MONTREAL • TORONTO

The Effect of pH ON THE EFFICIENCY OF VARIOUS MOLD Inhibiting Compounds*

F. J. BANDELIN†

Twelve compounds having antifungal activity were investigated at pH levels of 3, 5, 7, and 9 for the effects of pH changes on their relative efficacy against four common mold contaminants. Tests conducted utilized standardized spore suspensions planted on sterile slants of a modified Sabouraud's agar medium containing graded amounts of the antifungal compounds. A majority of the compounds investigated showed a progressive loss of antifungal activity with increasing pH values to the point that some were totally ineffective in the neutral and alkaline range.

Numerous studies concerning the efficiency of various antifungal and preservative agents have appeared in the pharmaceutical literature and recommendations for effective concentrations of these compounds have been given for the preservation of pharmaceutical and cosmetic preparations. Much of this information is based on empirical work for, although some knowledge of the influence of pH on activity has been gathered for some of the preservatives available, no systematic or comprehensive investigation of the effect of pH on the efficiency of various antifungal compounds has appeared.

Probably the oldest and most widely used preservatives in the food and drug and cosmetic industries are benzoic and salicylic acids. Their activity in acid media is well known as is their lack of activity in neutral or alkaline media. The history and use of these compounds is adequately reviewed by McCulloch (1), Gershenfeld (2), and others (3).

The alkyl esters of *p*-hydroxybenzoic acid are also widely used in the pharmaceutical industry. The history of their practical application dates back to 1924 when Sabalitschka (4, 5) presented the first of his numerous reports on their antibacterial and antifungal activity. His prodigious investigations with the esters of *p*-hydroxybenzoic acid resulted in his more than 60 publications on the subject. His work in this field has been reviewed by Neidig and Burrell (6), and by Bandelin (7). More recent work on these compounds, including acute and chronic toxicity, and the physiological disposition of these compounds has been published by Aalto, *et al.* (8), Matthews, *et al.* (9), and by Jones, *et al.* (10).

Kojic acid is of interest because it is one of the first antibiotic substances isolated. It is produced by Aspergilli and was first isolated in 1907 by Saito (11). Its activity as an antibacterial and antifungal agent was first reported by Yabuta in 1912, (12, 13). It is, however, not a particularly potent antifungal compound.

In 1913, Kiesel (14) published an extensive study of the relationship between chemical structure and fungicidal activity in the fatty acid series. Interest was not aroused however until Peck and his associates (1938, *et seq.*) reinvestigated the fungicidal properties of fatty acids and demonstrated that the antifungal activity of sweat was due to the fatty acids contained therein, and introduced sodium propionate as a clinical fungicide (15-17). Sodium propionate has become widely used as a preservative in the food industry, especially in bread and cheese (18,19).

Dehydroacetic acid, although not widely used, is potentially an excellent preservative. Chemically it is 3-acetyl-6-methyl-1,2-pyran-2,4(3H)-dione. It is prepared by the interaction of two moles of ethyl acetoacetate (20). The application of dehydroacetic acid as a preservative for food and dairy products has been investigated and reported (21-23). It is active against both bacteria and fungi (24).

Sorbic acid is a development of the work of Gooding (25) who demonstrated that certain of the α,β-unsaturated fatty acids are suitable fungistatic agents for foods. It is synthesized from crotonaldehyde and malonic acid (26). Smith and Rollin (27) found it superior to sodium benzoate as a fungistatic agent for cheese products and Puls, *et al.* (28), have investigated its use as a preservative for pharmaceutical preparations.

Both vanillin and ethyl vanillin have found use both as food preservatives (29, 30) and in therapy (31, 32).

In all the literature pertaining to these various compounds, actual data concerning the specific effect of relative acidity or alkalinity on their activity is exceedingly sparse. We have selected these compounds, some established preservatives, and some new, in order to compare their activities at various pH levels over a broad range against four common molds which are likely contaminating agents. We have attempted to determine which of the compounds offer the best activity at a given pH in

*Reprinted from the Journal of the American Pharmaceutical Assn., Vol. XLVII, No. 10 (1958) †Strong, Cobb and Co., Cleveland, Ohio

an effort to assist in selections for pharmaceutical formulations. The investigations carried on in this laboratory are therefore reported here.

Experimental

The test cultures employed in this work were *Aspergillus niger, Penicillium citrinum, Alternaria solani,* and *Chaetomium globosum.* These were propagated and spores derived by inoculating the surface of a Sabouraud's agar medium, poured to a depth of approximately ¼ inch, in the bottom of a 250-ml. Erlenmeyer flask, with spores of the test organism and incubating at 30°, for twenty-one days. At the end of this time the spores were harvested by washing the surface of the medium with sterile distilled water, using aseptic technique, and diluting the washings with sterile water to a standard suspension containing 20,000 spores per ml. as determined by serial dilution and counting on agar plates.

The modified Sabouraud's agar employed was enriched with yeast extract and consisted of the following:

Peptone	10 Gm.
Agar	18 Gm.
Corn syrup solids[1]	40 Gm.
Yeast extract (Difco)	2 Gm.
Buffer solution, *q. s.*	1,000 ml.

Buffer solutions were prepared at pH 3, 5, 7, and 9 by mixing 0.2 *M* dibasic sodium phosphate solution with 0.1 *M* citric acid solution. These citrate-phosphate buffers were used to prepare the agar media which were readjusted with a pH meter at 45° in the fluid state after the addition of the test compounds.

The test compounds employed were as previously mentioned; benzoic acid, salicylic acid, the methyl, ethyl, propyl, and butyl esters of *p*-hydroxybenzoic acid, kojic acid, propionic acid, dehydroacetic acid, sorbic acid, vanillin, and ethyl vanillin.

Where necessary to put these compounds into solution their sodium salts were used. They were dissolved in the warm, fluid agar medium at each designated pH level in concentrations of from 0.2% in decreasing increments to the lowest concentration required to exhibit inhibition (0.001%) as indicated in the following tables. Slants were prepared at each pH and concentration level

TABLE I.—MINIMUM CONCENTRATION (PER CENT IN MEDIA) REQUIRED FOR INHIBITION OF MOLD GROWTH AT pH 3.0

	Chaetomium globosum	*Alternaria solani*	*Penicillium citrinum*	*Aspergillus niger*
Kojic acid	0.08	0.20	0.20	+
Benzoic acid	0.08	0.10	0.10	0.04
Salicylic acid	0.02	0.02	0.02	0.04
Methyl *p*-hydroxybenzoate	0.06	0.06	0.05	0.08
Ethyl *p*-hydroxybenzoate	0.02	0.02	0.02	0.04
Propyl *p*-hydroxybenzoate	0.008	0.015	0.005	0.02
Butyl *p*-hydroxybenzoate	0.003	0.005	0.002	0.015
Propionic acid	0.04	0.04	0.04	0.08
Dehydroacetic acid	0.001	0.001	0.001	0.002
Sorbic acid	0.01	0.005	0.02	0.04
Vanillin	0.08	0.02	0.06	0.10
Ethyl vanillin	0.04	0.01	0.02	0.06

TABLE II.—MINIMUM CONCENTRATION (PER CENT IN MEDIA) REQUIRED FOR INHIBITION OF MOLD GROWTH AT pH 5.0

	Chaetomium globosum	*Alternaria solani*	*Penicillium citrinum*	*Aspergillus niger*
Kojic acid	+	+	+	+
Benzoic acid	0.10	0.15	0.20	0.20
Salicylic acid	0.10	0.20	0.10	0.15
Methyl *p*-hydroxybenzoate	0.06	0.08	0.08	0.10
Ethyl *p*-hydroxybenzoate	0.03	0.04	0.03	0.06
Propyl *p*-hydroxybenzoate	0.01	0.02	0.01	0.03
Butyl *p*-hydroxybenzoate	0.008	0.01	0.005	0.02
Propionic acid	0.04	0.06	0.08	0.08
Dehydroacetic acid	0.005	0.002	0.005	0.005
Sorbic acid	0.06	0.02	0.08	0.08
Vanillin	0.01	0.06	0.10	0.20
Ethyl vanillin	0.06	0.04	0.04	0.06

TABLE III.—MINIMUM CONCENTRATION (PER CENT IN MEDIA) REQUIRED FOR INHIBITION OF MOLD GROWTH AT pH 7.0

	Chaetomium globosum	*Alternaria solani*	*Penicillium citrinum*	*Aspergillus niger*
Kojic acid	+	+	+	+
Benzoic acid	+	+	+	+
Salicylic acid	+	+	+	+
Methyl *p*-hydroxybenzoate	0.08	0.08	0.08	0.10
Ethyl *p*-hydroxybenzoate	0.04	0.05	0.04	0.06
Propyl *p*-hydroxybenzoate	0.02	0.03	0.02	0.04
Butyl *p*-hydroxybenzoate	0.01	0.02	0.015	0.02
Propionic acid	0.15	+	+	0.20
Dehydroacetic acid	0.04	0.02	0.04	0.04
Sorbic acid	0.10	0.08	0.08	0.10
Vanillin	0.10	0.10	0.10	0.20
Ethyl vanillin	0.06	0.04	0.04	0.06

TABLE IV.—MINIMUM CONCENTRATION (PER CENT IN MEDIA) REQUIRED FOR INHIBITION OF MOLD GROWTH AT pH 9.0

	Chaetomium globosum	*Alternaria solani*	*Penicillium citrinum*	*Aspergillus niger*
Kojic acid	+	+	+	+
Benzoic acid	+	+	+	+
Salicylic acid	+	+	+	+
Methyl *p*-hydroxybenzoate	0.10	0.10	0.15	0.15
Ethyl *p*-hydroxybenzoate	0.06	0.08	0.10	0.08
Propyl *p*-hydroxybenzoate	0.04	0.05	0.06	0.05
Butyl *p*-hydroxybenzoate	0.02	0.03	0.03	0.03
Propionic acid	+	+	+	+
Dehydroacetic acid	0.10	0.20	0.20	0.20
Sorbic acid	+	+	0.20	+
Vanillin	0.10	0.10	0.10	+
Ethyl vanillin	0.06	0.04	0.04	0.06

[1] Used instead of dextrose.

[2] At pH 9.0, the esters of *para*-hydroxybenzoic acid, sorbic acid, vanillin, and ethyl vanillin were added to 7 cc. of the agar medium concentrate, at 50°, using 1 cc. sterile solutions of their sodium salts, sterilized by filtration, and of appropriate concentration to produce the desired concentration in the completed media. This was done to avoid hydrolytic destruction on autoclaving. This produced no noticeable change in pH.

Yaminal

PURE AMYL CINNAMIC ALDEHYDE

The remarkable improvements that extreme purity confers upon the odours of aromatic chemicals are strikingly illustrated in YAMINAL. Heretofore, the jasmin-like odour of amyl cinnamic aldehyde has only been perceived, marred and debased, through a screen of unpleasantly fatty by-odours. Now, for the first time, this screen has been lifted and we are offering YAMINAL—a synthetic of such purity and sweet, flowery fragrance that it cannot fail to become the ideal complement to the costly Jasmine Absolute. A uniform chemical body, stabilised by the addition of 0.1% *para-tertiary* butylcatechol, YAMINAL will solve many of the perfumer's formulation problems. No compounding room is complete without YAMINAL— the perfect amyl cinnamic aldehyde.

ONE OF THE ABRAC PURE PERFUMERY CHEMICALS

ABRAC

A. BOAKE, ROBERTS & CO LTD · LONDON · ENGLAND

AGENTS FOR U.S.A. TOMBAREL PRODUCTS CORPORATION · 725 BROADWAY · NEW YORK 23

using 8 ml. of media per tube and these were plugged with cotton and sterilized by autoclaving.[2]

Five slants were prepared at each concentration and for each compound for each of the four test organisms. Slants were inoculated with one drop of standard spores suspension placed on the surface of the slant. All tubes were incubated at 30° and observed daily for fourteen days. Reproducibility was good in all cases, and the criterion of inhibition was lack of visible growth in all five tubes at the end of the fourteen-day incubation period. Where growth occurred in all tubes at the 0.2% level it is indicated by a plus sign since this concentration was the maximum used for all compounds. Otherwise the lowest concentration at which no growth occurred in fourteen days is indicated in the following tables.

Discussion

It is apparent from the data in these tables that the majority of the compounds, while fairly active antifungal agents at pH values of 3.0 and 5.0, became progressively less active as the pH increased so that at the higher pH levels of 7.0 and 9.0 they were relatively ineffective or only slightly active against the molds.

Kojic acid, the least active of the group, exhibited slight activity barely within the upper limit of concentration of the test procedure. At 0.2% concentration it did not inhibit *Aspergillus niger*, even at pH 3.0.

Benzoic and salicylic acids were active inhibitors at pH 3.0 and 5.0; salicylic acid being more effective in lower concentrations than benzoic acid. At pH 7.0 and 9.0 however, no activity was evident at the maximum concentration of 0.2% in the media.

The esters of *p*-hydroxybenzoic acid were least affected by pH changes. There was a slight reduction in activity at the higher pH levels, but nothing like the reduction of activity encountered with most of the other compounds in the alkaline range. It is a well-known fact that the activity of these esters increases with increasing molecular weight. In this respect, an interesting observation was made during the investigation concerning the apparent progressive loss of differential ratio in activity of the higher molecular weight esters with increasing pH values. Whereas the differential between the methyl and butyl *p*-hydroxybenzoates with *Chaetomium globosum* at pH 3.0 is a ratio of 20:1, at pH 9.0 the differential is 5:1. Against *Alternaria solani* at pH 3.0 the ratio is 12:1, at pH 9.0 it is 3.3:1. Against *Penicillium citrinum* at pH 3.0 the differential ratio is 25:1, while at pH 9.0 it is 5:1; while against *Aspergillus niger* at pH 3.0 it is 10:1, at pH 9.0 it becomes 5:1.

The activity of propionic acid which was quite high at pH 3.0 was fair at pH 5.0 and was considerably reduced at pH 7.0. It failed completely at pH 9.0.

Dehydroacetic acid exhibited excellent activity at pH 3.0 and 5.0, and good activity at pH 7.0, but had rather poor activity at pH 9.0.

Sorbic acid was similar but superior to propionic acid in activity. Also like propionic acid it had no activity at the 0.2% level at pH 9.0.

Both vanillin and ethyl vanillin had good activity at pH 3.0, and although their activity was slightly reduced at pH 5.0, it seemed to be relatively little affected by pH changes above 5.0. At pH 9.0 both exhibited activity with ethyl vanillin being comparable to the esters of *p*-hydroxybenzoic acid.

Although much of the recent work on fungicides has been done utilizing the agar cup plate or filter paper disk techniques, we felt that although these methods were satisfactory for comparing the relative efficiency of these

Sur Facts

from the new Kessler Catalog

A wealth of practical information on the surface active problems of the Cosmetic industry is embodied in the new Kessler Cosmetic Catalog, just off the press, containing practical application data, as well as a large number of tested formulations. Kessler offers several generic classes of surfactant materials, including the laurate, oleate and stearate esters of:

Polyethylene Glycols
Glycerol
Ethylene Glycol
Propylene Glycol
Diethylene Glycol

KESSLER ESTERS FOR INDUSTRY SINCE 1921

Write today for Kessler's Cosmetic Catalog

KESSLER CHEMICAL CO., Inc. PHILADELPHIA 35, PA.

Interested in cosmetic material trade names?

The 'International Encyclopedia of Cosmetic Material Trade Names,' by Maison G. DeNavarre, is the one comprehensive source book of the industry.

It offers a wealth of information on the materials used in cosmetic practice the world over —includes more than 3,000 trade names.

And the "International Encyclopedia' not only describes the materials, and the names and addresses of the suppliers. It also offers a complete cross-indexed classification of the materials, and their uses.

426 pages, 6" x 9", the 'International Encyclopedia' will be shipped anywhere in the world at $7.50 a copy postpaid.

Book Division
Moore Publishing Company
48 West 38 Street, New York 18

You're in experienced hands when Penick supplies your

ESSENTIAL OILS
AROMATIC CHEMICALS
PERFUME COMPOUNDS
SPECIALTY PRODUCTS
RESINS (Absolute and Soluble)

No other supplier has had such long experience in working with as wide a range of natural products as Penick. You can profit by this experience three ways.

1. By being assured of highest quality raw materials from the world over.
2. By taking advantage of Penick's unexcelled service.
3. By using our technical staff to help in selecting the most effective materials to fit your specific needs and to assist in creating new products.

Your inquiries will receive prompt attention.

PENICK

Perfume, Flavor and Aromatic Chemicals Division

S. B. PENICK & COMPANY · 100 CHURCH ST., NEW YORK 8 · 735 W. DIVISION ST., CHICAGO 10

EXCLUSIVE SALES AGENTS

R. W. Greeff & Co., Inc.

10 Rockefeller Plaza
New York 20, N.Y.

•

Tribune Tower, Chicago 11, Illinois

•

Preservatives

• • • • • • • • • •

METHYL PARABEN

PROPYL PARABEN

CRESOPHAN

Antioxidants

• • • • • • • • • •

ETHYL HYDROCAFFEATE

MELILOTIN

PARA HYDROXY ANISOL

PROPENYL METHYL GUAETHOL

•

MANUFACTURED BY

Fries Bros., Inc.

CARLSTADT, NEW JERSEY

compounds with each other, the technique employed here was more suited to practical application in that it gives an idea of the actual concentration of the compounds required to produce complete inhibition of the molds at a given pH in a highly nutrient medium. That this modification of Sabouraud's agar enriched with yeast extract is a highly acceptable medium for growth of the organisms was illustrated by the fact that the organisms grew luxuriantly upon it at all pH levels in control tubes containing no inhibitor.

Summary and Conclusions

Twelve compounds having antifungal activity were investigated for their effect against four common molds at pH levels of 3, 5, 7, and 9. The molds used were *Chaetomium globosum*, *Alternaria solani*, *Penicillium citrinum*, and *Aspergillus niger*. Spores of these organisms were inoculated upon the surface of a modified Sabouraud's agar enriched with yeast extract and containing varying concentrations of the preservative compounds up to a maximum of 0.2%. Criterion of inhibition was lack of visible growth in all of five tubes at any concentration after incubation at 30° for fourteen days.

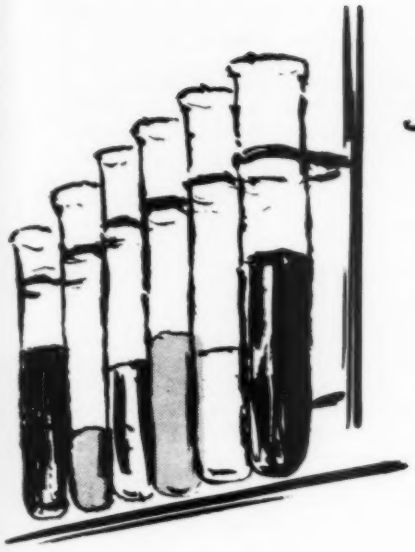
The organic acids such as benzoic, salicylic, propionic, and sorbic all lost activity with increasing pH. Kojic acid was the poorest inhibitor at all levels. Dehydroacetic acid had excellent activity in the acid range, but its activity was also reduced at the alkaline level.

The activity of the esters of *p*-hydroxybenzoic acid was only slightly affected by pH changes and these compounds probably have the greatest utility as preservatives for pharmaceutical preparations generally. Progressive loss of differential in activity was noted with the higher molecular weight esters with increasing pH values.

Vanillin and ethyl vanillin appear to have marked preservative properties which are not materially affected by pH changes. Their activity shows little change even at elevated pH levels.

References

(1) McCulloch, E. C., "Disinfection and Sterilization," 2nd ed., Lea and Febiger, Philadelphia, 1945.
(2) Gershenfeld, L., "Bacteriology and Allied Subjects," Mack Printing Co., Easton, Pa., 1945.
(3) Reddish, G. F., "Antiseptics, Disinfectants, Fungicides and Sterilization," Lea and Febiger, Philadelphia, 1954.
(4) Sabalitschka, T., *Chem. Ztg.*, 118, 703(1924).
(5) Sabalitschka, T., *Apotheker Ztg.*, 39, 1160(1924).
(6) Neidig, C. P., and Burrell, H., *Drug & Cosmetic Ind.*, 54, 408, 481(1944).
(7) Bandelin, F. J., *ibid.*, 64, 430(1949).
(8) Aalto, T. R., Firman, M. C., and Rigler, N. E., *This Journal*, 42, 449 (1953).
(9) Matthews, C., Davidson, J., Bauer, E., Morrison, J., and Richardson, A. P., *ibid.*, 45, 269(1956).
(10) Jones, P. S., Thigpen, D., Morrison, J. L., and Richardson, A. P., *ibid.*, 45, 268(1956).
(11) Saito, K., *Japan. J. Botany*, 21, 7(1907).
(12) Yabuta, T., *Intern. Congr. Pure and Appl. Chem.* (appendix), 25, 455 (1912).
(13) Yabuta, T., *J. Chem. Soc. Japan*, 37, 1185(1916).
(14) Kiesel, A., *Ann. inst. Pasteur*, 27, 391(1913).
(15) Peck, S. M., and Rosenfeld, H., *J. Invest. Dermatol.*, 1, 237(1938).
(16) Peck, S. M., Rosenfeld, H., Leifer, W., and Bierman, W., *Arch. Dermatol. u. Syphilis*, 39, 126(1939).
(17) Peck, S. M., and Russ, W. R., *ibid.*, 56, 601(1947).
(18) Wolford, D. A., and Andersen, T. S., *Food Inds.* 17, 622(1945).
(19) Olsen, S. A., and Macy, P. R., *J. Dairy Sci.*, 23, 196(1946).
(20) Hornung, E. C. *Org. Synthesis*, 3, 231(1955).
(21) Brunner, J. R., and Mallmann, W. L., *Mich. State Univ. Agr. Exp. Sta. Mem. Quart. Bull.*, 33, 127, 142(1950).
(22) Wolf, P. A., *Food Technol.*, 4, 294(1950).
(23) Dow Chem. Co., *Tech. Bull.*, March 21, 1951.
(24) Wolf, P. A., and Westveer, W. M., *Arch. Biochem.*, 28, 201(1950).
(25) Gooding, C. M., U. S. pat. 2,379,294.
(26) Hornung, C. N., *Org. Synthesis*, 3, 783(1955).
(27) Smith, D. P., and Rollin, N., *Food Research*, 19, 59(1954).
(28) Puls, D. D., Lindgren, L. F., and Cosgrove, F. P., *This Journal*, 44, 85 (1955).
(29) Pearl, I. A., and McCoy, J. F., *Food Ind.*, 17, 1458(1945).
(30) Evans, F. R., and Curran, H. R., *Food Research*, 13, 66(1948).
(31) Christie, A., Middleton, J. G., Peterson, J. C., and McVicker, D. L., *Am. J. Diseases Children*, 80 874(1950).
(32) Mitchell, J. H., and Hiss, F. W., *A. M. A. Arch. Dermatol.*, 64, 247 (1951).



The Interference of NONIONIC EMULSIFIERS with PRESERVATIVES

M. G. deNAVARRE

The widespread use of nonionic surfactants as emulsifiers, solubilizers and detergents has brought a new problem to the fore, namely the inactivation of germicides and preservatives. DeNavarre (1) has summarized his work on this subject from a bacteriological point of view. On the other hand, Kostenbauder and co-workers (2) have published several papers on the complexing of macromolecules with phenolic germicides, nonionic surfactants among them.

DeNavarre has tested over fifty different nonionics and over forty different bactericides and fungicides during the course of the last seven years.

Types Tested

All the principal types of commercially available nonionics have been used. The following are the main classifications:

Fatty Acid Polyol Esters	Span
Fatty Acid Polyol Esters Ethoxylate	Crill
Fatty Acid Ethoxylate	Myrj
Fatty Alcohol Ethoxylate	G-3720
Polyethylene Glycols	Carbowax
Ethoxylated Higher Phenols	Triton X-100
Polyethylene Polypropylene Glycols	Pluronics
Ethoxylated Sodium Alkyl Sulfates	Sipon ES

In addition to these, two ampholytes, three anionics and three "quats" were included in the experiments.

Microorganisms Used

The microorganisms used consisted of the following: *Penicillium chrysogenum, Aspergillus niger, Rhizopus nigricans, Candida albicans, Alternaria solani, Oidium lactis, Mucor racemosa, Bacillus subtilis, Pseudomonas aeruginosa, Proteus vulgaris, Escherichia coli* and *Torula roseus.*

While agar slants were used in some of the tests, most of the work was done with liquid Jaag medium. The pH was varied in the tests all the way from pH 3.5 to pH 10.5. Furthermore, a large portion of the tests were made mainly with *A. niger* but periodically rechecked against the other organisms in appropriate media. All other predictable variables were studied.

Results

The results indicated that the following germicides, fungicides or preservatives were all inactivated at varying rates and degrees:

Rotax	Nipa No. 82121
Salicyl Anilide	P-594
TMTD	P-750
Isothan Q 15	Roche #1-7142
Vancide 89	Roche #1-7253
Hexyl & Heptyl Paraben	Benzoic Acid
Actamer	PCMX
p-Cholorobenzoic Acid	
Dehydroacetic Acid	
Ethyl Vanillate	Mixed *p*-hydroxybenzoates
o-Phenylphenol	Sodium Benzoate
Ethyl Gallate	Sodium Dehydroacetate
Octyl Gallate	Sodium methyl *p*-hydroxybenzoate
Lauryl Gallate	Sodium *o*-phenylphenol
Collatone	Sorbic Acid
Methyl *p*-hydroxybenzoate	Usnic Acid
Propyl *p*-hydroxybenzoate	Formaldehyde

Of the preservatives tried, TMTD 0.1 per cent prevented the growth of *A. niger* in a Jaag medium containing 2 per cent of an ethoxylated nonionic for one year. Trichlorophenyl acetate under exactly similar conditions showed growth in eight months. Ortho-phenylphenol, dehydroacetic acid and mixtures of DHA and sorbic acid showed possibilities in special cases.

The per cent of *p*-hydroxybenzoates inactivated by a given nonionic based on separations of complexed preservative from free preservative by dialysis through nylon membranes as determined by Kostenbauder, has been summarized by Barkley in his paper, a part of this

LET'S TALK PRESERVATIVES

Mr. Manufacturer: If your product must have a . . .

FUNGICIDE
DEODORANT
BACTERICIDE
ANTI-DANDRUFF
PRESERVATIVE
ANTI-OXIDANT

You will profit by investigating the new Germicides and Anti-oxidants developed by the R. T. Vanderbilt Company. An impressive series is available for specific uses. The few mentioned here are typical.

VANCIDE® 89RE is remarkably specific as an anti-dandruff agent. It is also unusual in its effectiveness against both Gram positive and Gram negative bacteria. It is non-toxic and non-irritating.

VANCIDE® BL It is our name for bithionol USP. It is a superior bactericide for use in soaps and other antiseptic skin preparations.

VANCIDE® BN is the sodium salt of bithionol, particularly suitable where a water or alcohol soluble fungicide is required.

METHYL TUADS® WT is tetramethyl thiuram disulfide, specially purified by an exclusive VANDERBILT process. It reduces odor producing bacteria on the skin.

VANLUBE® PCX is our grade of butylated hydroxy toluene, specifically designed for the food and cosmetic industries where purity, uniformity and non-toxicity are essential. It is an excellent oxidation inhibitor.

You incur no obligation by asking VANDERBILT to suggest the best Preservative for your needs.

R. T. VANDERBILT CO. Specialties Department
230 PARK AVENUE
NEW YORK 17, NEW YORK **P-11**

( ) **Send VANCIDE 89RE Bulletin 18A**
( ) **Send VANCIDE BL Bulletin VBL-1A**
( ) **Send VANCIDE Bulletin BN**
( ) **Send METHYL TUADS WT Bulletin MT-1A**
( ) **Send VANLUBE PCX Bulletin**
( ) **Please send samples**

State Application .....

Name .....

Title .....

(Please attach to your Company letterhead)

symposium. These data show that very substantial amounts of preservative are inactivated.

However, the degree of inactivation varies widely between nonionics and preservatives. DeNavarre has found that the degree of inactivation increases with the amount of ethylene oxide added, or to put it differently, with the higher molecular weight of the ETO polymer. The presence of other ingredients, such as electrolytes and alcohol affects the phenomenon.

Prevention of Inactivation

In the study of this problem, the effect of anionics, ampholytes and quaternaries was observed. The "quats" either prevent inactivation of the preservative by the nonionic or they form a more effective synergistic combination with the remaining uncomplexed preservative, when they comprised 20 per cent of the surfactant mixture. The ampholytes varied in their properties with the product used and the pH of the medium. The anionics were the least useful for this purpose.

Recently, Poprzan (3) has studied the effect of monohydric and polyhydric alcohols on the prevention of inactivation of preservatives by nonionics. Ethyl alcohol; 1,3-propanediol; 1,2-propanediol; glycerol; hexylene glycol; 1,3-butylene glycole; 1,4-butylene glycole; 1,2,6-hexanetriol, dipropylene glycole and sorbitol were used. Early results indicate that neither glycerol nor sorbitol affect inactivation of preservatives in any way in concentrations up to 10 per cent.

However, 5 per cent hexylene glycol or ethyl alcohol along with 0.2 per cent methyl *p*-hydroxybenzoate prevent growth of both molds and bacteria in a nonionic medium for six months. The remaining glycols vary in their effectiveness in concentrations ranging from 5 to 10 per cent.

Practical Application

Some claim that these laboratory results do not translate into practice because widespread preservative failure has not been observed.

One of the peculiarities of preservative failure in nonionic finished products is that it rarely appears in all the filled units of a batch.

Some perfume oils are fairly good preservatives in themselves when used in nonionic emulsions containing traditional preservatives, enough synergistic action may occur to prevent *appearance* of spoilage.

Propylene and hexylene glycols in amounts as low as 5 per cent have a similar protective influence.

Size and virility of the inoculum in finished goods may be too low and will vary between units of one batch and with the products. When all conditions for growth are just right, spoilage will occur, but not otherwise.

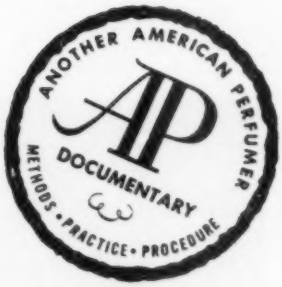
Not only is visible spoilage to be considered but one must also keep in mind that certain microorganisms produce esterases capable of splitting the nonionic emulsifier in sufficient amounts to cause emulsion instability before the usual appearance of spoilage is observed.

Conclusion

Nonionic surfactants do inactivate preservatives to varying degrees. Exact percentage inactivated can be estimated by dialysis. Certain mono and polyhydric alcohols, and quaternary surfactants either prevent inactivation or are sufficiently synergistic to noninactivated preservative residues to prevent spoilage.

References

(1) deNavarre, M. G., *J. Soc. Cosmetic Chemists*, 8, 371 (1957).
(2) Patel, N. K., and Kostenbauder, H. B., *J. Am. Pharm. Assoc. Sci. Ed.*, 47, 289 (1958).
Pisano, F. D. and Kostenbauder, H. B., In press.
Miyawaki, G. M., Patel, N. K., and Kostenbauder, H. B., In press.
(3) Poprzan, J., Private communication.



P-HYDROXYBENZOIC ESTERS AS PRESERVATIVES for Cosmetics

E. L. BARKLEY

Cosmetics, by virtue of their end use, demand a level of "elegance" seldom required for most other consumer products. Appeal to the consumer of cosmetics consists of many factors. The most basic, of course, is the offering of a product which will maintain its effectiveness, consistency and eye-appeal from the time of manufacture until the last portion of it has been used. The choice of preservative, where necessary, to perform these functions is of utmost importance.

The characteristics of the ideal preservative were formally outlined by Gershenfeld and Perlstein (1). These are summarized as follows:

1. It must be effective under the conditions of use.
2. It must be soluble in the concentration used.
3. It must be stable and capable of sustained action.
4. It must be colorless and odorless, or nearly so.
5. It must be economical.
6. It must be non-toxic.

Effectiveness under conditions of use implies an inhibiting effect against all types of microorganisms causing decomposition. This characteristic is of such a nature as to prohibit complete fulfillment under any circumstances. It is doubtful if any single chemical agent will ever be found to be wholly effective in inhibiting all types of microorganisms and still fulfill the other characteristics of the ideal preservative. Effectiveness under conditions of use implies that the preservative must have few incompatibilities with the usual cosmetic ingredients, must retain its effectiveness over a wide pH range, and, in itself, must not alter the pH of the system to be preserved.

The characteristic of "soluble in the concentration used" includes considerations of ease of formulation of the preservative into the product. The stability characteristic would tend to preclude the use of volatile substances as preservatives. The characteristics of "colorless and odorless" are necessary in order that the preservative not alter the product objectionably as far as color and odor are concerned. Included in the consideration of non-toxicity is the absolute necessity for cosmetic preparations, that the preservative not produce sensitization or irritation of the skin in normally-used concentrations.

To be suitable for use in cosmetics, a preservative must, naturally, comply with the requirements of the "ideal" preservative. Because of the nature of the product, however, color, odor, stability, effectiveness in slightly alkaline media, and reaction on the skin of the preservative are especially important considerations. The esters of p-hydroxybenzoic acid, sold under the trade name PARASEPT(R), possess the desired properties to a high degree and are widely used in cosmetics. These products, effective in low concentrations, are colorless and neutral. They are essentially nontoxic, nonvolatile, stable, and effective against diverse microorganisms in acid, neutral and alkaline medium.

The esters of para-hydroxybenzoic acid were first re-

It stands apart...

Essentially for you

D&O
ESTABLISHED 1798

Our 160th Year of Service

flavor bases
dry soluble seasonings
essential oils
aromatic chemicals
perfume bases

because it's the strongest, the wisest, the most revered. The others look up to him, lean on his wide knowledge, are guided by his greater experience.

Even among the wise and the learned, one is always outstanding . . . the acknowledged leader, accepted as such by all. A perfume composition by D&O reflects the same qualities of leadership. Based upon the solid foundation of skilled technical personnel, finest grade raw ingredients and the cumulative experience of more than 160 years, a D&O fragrance product "always stands apart".

Technical assistance available on your premises.

DODGE & OLCOTT, INC.

180 Varick Street, New York 14, N. Y.

Sales Offices in Principal Cities

ported useful in preserving cosmetics, among other products, by Sabalitschka (2) in Germany in 1924. Sebsequent to the publication of this information, many articles on the subject appeared in European journals. (R)Registered Trademark, Heyden Newport Chemical Corp. An excellent review article of this abundant literature was written by Neidig and Burrell (3) in 1944. In their consideration of the "ideal" preservative, Gershenfeld and Perlstein (1) concluded that the esters of para-hydroxybenzoic acid were the most useful preservatives available, when evaluated on the basis of their criteria. More recently, Rigler and Schimmel (4), in their chapter on the preservation of cosmetics in "Cosmetics-Science and Technology", edited by Sagarin, have confirmed this opinion. Aalto and his associates (5) reviewed the uses and antibacterial and antifungal studies, properties and determination of p-hydroxybenzoic acid esters

The very important consideration of reaction on the skin of the p-hydroxybenzoates was studied by Shelanski and reported on by Sokol (6). Following the Food and Drug Administration's recommended procedure for the determination of allergic reactions in guinea pigs, 0.1% solutions of methyl, ethyl, propyl and butyl p-hydroxybenzoates in physiological saline were used to determine primary irritation and sensitization effects of the esters on male guinea pigs. No reaction of the animals in either of the tests was observed. Sokol (6) also reported on irritation and sensitization studies of 50 human subjects. The study showed that, at concentrations of 5% (weight/volume) in propylene glycol, no irritation was observed in any of the subjects and that no sensitization was detected. These studies indicated that the four lower alkyl esters of p-hydroxybenzoic acid are remarkably free from undesirable allergenic behavior.

The very complex problem of the preservation of cosmetics in this review will be limited to a consideration of the deterioration of products which are related to the growth of microorganisms. Among the very unfavorable changes which can occur in cosmetics due to the action of bacterial and fungi are the development of color, odor and textural changes in the product.

De Navarre (7) has pointed out that further study of deteriorated cosmetics is indicated in order to enlarge on the relatively meager literature available on contaminating organisms commonly found in cosmetics. Considerable work has been done on determining the antimicrobial properties of the p-hydroxybenzoates. Included in the study were several organisms which commonly cause deterioration in cosmetics, and the results were reported in the article by Aalto, Firman and Rigler (5).

In the investigation of the antifungal activity of the p-hydroxybenzoates, the samples were dissolved in methanol at such concentrations that, when 0.5 cc. was added to the 25 cc. broth, the flasks contained the concentration shown. Twofold increments were generally used. The medium was made up as follows: honey 85 Gm., peptone 10 Gm., water 1 L. The broth was dispensed into 125 cc. Erlenmeyer flasks, and the flasks were plugged and autoclaved for twenty minutes at 20 lb. pressure. A blanket of inoculated medium and a control of 0.5 cc. methanol were run. Each flask was inoculated with one drop of spore suspension made by adding 25 cc. of sterile water to a well grown-out slant of the organism. Each concentration of each compound was run in triplicate. The flasks were allowed to stand for seven days. At the end of this time the quantity of growth was read, calling the growth in the blank flask 4+.

The effectiveness of methyl, ethyl, propyl and butyl p-hydroxybenzoates against "Asperigillus niger" over the pH range of 4 to 8 has been determined. No real difference in effectiveness was noted over the pH range. At pH values over 8 it is logical to assume that there would be some diminution in effectiveness of the esters as the pH approaches the pK value of the p-hydroxybenzoate. It is accepted that the undissociated ester molecule is more active than the p-hydroxybenzoate ion. At pH 8.5, the pK value for p-hydroxybenzoic acid, the concentration of the undissociated acid is only half of the total concentration and some decrease in effectiveness can be observed.

In further reference to the effectiveness, deNavarre and Bailey (8) have pointed out an apparent inactivation of various preservatives in the presence of nonionic surfactants. The effect is not observed with anionic surfactants. It is theorized that the interaction is hydrogen bonding between the hydrogen in a phenolic hydroxyl or carboxyl group in the preservative with an oxygen in the polyether chain (or other electron donor) in the surfactant. Patel and Kostenbauder (9) have carried out a study of this phenomenon. This paper and two other papers to be published report on the determination of the degree of interaction, relating to specific concentrations of the surfactant.

In general, the work of Kostenbauder and his associates indicates that the degree of binding is always a function of the concentration of the macromolecule. Any preservative bound to the macromolecule is of questionable effectiveness so far as antimicrobial activity is concerned. With a knowledge of the degree of interaction as determined by these investigators, it is possible to add a sufficient quantity of the preservative to compensate for the amount bound, leaving sufficient preservative to accomplish the necessary antimicrobial action. Other alternatives indicated are additives, such as propylene glycol or glycerol (frequently used as solvents or humectants), which interfere with the interaction of the preservative with the surfactant; the use of a surfactant, such as carboxymethylcellulose, agar or tragacanth, which is not susceptible to hydrogen bonding; or a combination of preservatives if a single preservative is being used. In this connection, preservatives are usually employed in a concentration in excess of the minimum inhibitory concentration required and, even though a reactive surfactant may be present in the product involved, an adequate level of preservation is realized.

With specific reference to esters of p-hydroxybenzoic acid, Kostenbauder and associates have reported the degree of binding with various macromolecules as follows in table II:

TABLE II—DEGREE OF BINDING OF *p*-HYDROXYBENZOATE ESTERS BY VARIOUS MACROMOLECULES

Macromolecule 2% W/V	Methylparaben Free	Methylparaben Bound	Propylparaben Free	Propylparaben Bound
Gelatin	92%	8%	89%	11%
Methylcellulose	91%	9%	87%	13%
Carbowax 4000	84%	16%	81%	19%
PVP	78%	22%	64%	36%
"Myrj 52"	55%	45%	16%	84%
"Tween 20"	43%	57%	14%	86%
"Tween 80"	43%	57%	10%	90%

In making antibacterial tests, the plate streak method was used. The dilutions of the sample were made in water, using sufficient sodium hydroxide for solubility. The medium was so prepared that, when 5.0 cc. of the sample was added to 10 cc. of medium, the proper concentration of p-hydroxybenzoates and ingredients was obtained. The medium was composed of glucose 22.5

TABLE I.—ANTIMICROBIAL ACTIVITIES OF *p*-HYDROXYBENZOATES*

Microorganisms	Required for-Inhibition %			
	Methyl	Ethyl	Propyl	Butyl
Aspergillus niger ATCC 10254	0.1	0.04	0.02	0.02
Penicillium digitatum ATCC 10030	0.05	0.025	0.0063	<0.0032
Rhizopus nigricans ATCC 6227A	0.05	0.025	0.0125	0.0063
Trichoderma lignorum ATCC 8678	0.025	0.013	0.0125	0.0063
Chaetomium globosum ATCC 6205	0.05	0.025	0.0063	<0.0032
Trichophyton mentagrophytes ATCC 9533	0.016	0.008	0.004	0.002
Trichophyton rubrum ATCC 10218	0.016	0.008	0.004	0.002
Candida albicans ATCC 10231	0.1	0.1	0.0125	0.002
Saccharomyces cerevisiae ATCC 9763	0.1	0.05	0.0125	0.0063
Saccharomyces pastorianus ATCC 2366	0.1	0.05	0.0125	0.0063
Bacillus subtilis ATCC 6633	0.2	0.1	0.025	0.0125
Bacillus cereus var. *mycoides* ATCC 6462	0.2	0.1	0.0125	0.0063
Staphylococcus aureus (*Micrococcus pyogenes* var. *aureus*) ATCC 6538P	0.4	0.1	0.05	0.0125
Sarcina lutea	0.4	0.1	0.05	0.0125
Klebsiella pneumoniae ATCC 10031	0.1	0.05	0.025	0.0125
Escherichia coli ATCC 9637	0.2	0.1	0.1	0.4
Salmonella typhosa	0.2	0.1	0.1	0.1
Salmonella shottmuelleri	0.2	0.1	0.05	0.1
Proteus vulgaris ATCC 8427	0.2	0.1	0.05	0.05
Aerobacter aerogenes ATCC 8308	0.2	0.1	0.1	0.4

* Precipitation was noted in those instances where the concentration used appreciably exceeded the water solubility of the ester.

Gm., peptone 15.0 Gm., sodium chloride 2.25 Gm., beef extract 4.5 Gm., agar 22.5 Gm., and water 1 L. The pH was approximately 6.8. The medium was dispensed into testtubes and sterilized. After addition of the samples, the contents of the tubes were poured into plates. Inoculations were made by dipping a loop in the suspension from 10 cc. of water on a twenty-four-hour slant of the organism and streaking on one sector on the plate. Readings were made after twenty-four hours.

The results of the study are summarized in Table I.

One of the more important characteristics of the ideal preservative is that it must be easily formulated into the product to be preserved. The incorporation of the p-hydroxybenzoic acid esters into various products requires a familiarity with their solubility characteristics, particularly in water. While their solubility in water is limited, they can be dissolved in aqueous products at room temperature provided good agitation is maintained. The rate of solution is a function of particle size. With the fine powders that are normally available, concentrations of 0.15% methyl, 0.10% ethyl, 0.03% propyl, or 0.015% butyl can be achieved in twenty or thirty minutes, according to laboratory tests. A coarse powder, on the other hand, dissolves only after long, continued stirring.

The esters can be dissolved more rapidly by heating the medium to 70 or 75° and stirring until solution is complete. This temperature should be kept about 20° below the melting point of the ester used, to prevent agglomeration of the particles. Other methods of incorporation involve the preparation of solutions of the esters in solvents. Alcohol is frequently used, and often one of the other ingredients, such as oil or propylene glycol, will serve as a solvent. Such a solution must be added slowly with stirring to the aqueous phase, in order to prevent precipitation of the ester. The concentration in the solvent should not be over 15% with the methyl ester or 2.5% with the propyl to obtain clear solutions without heating.

The resistance of the p-hydroxybenzoates to saponification makes it possible to dissolve them in 5% sodium hydroxide to form the soluble sodium salts thus providing another means of incorporation. Only about 80% of the stoichiometric quantity of alkali is needed for solubilization, as for example, 4.20 lb. of 5% NaOH per pound of methyl p-hydroxybenzoate. Such solutions should be kept below 30° and used the same day as prepared. When used to give an ester concentration of 0.1%, they raise the pH of neutral, unbuffered products to about 9. In order to adjust the pH to 7, an amount of suitable acid, equivalent to the alkali used, should be added. This method of incorporation is equivalent to using the dry sodium salts of the esters, which have been prepared but have the disadvantages of caking and hydrolyzing in the presence of moisture.

While the cosmetic formulator has available a wide choice of preservatives, the requirements of the "ideal preservative" are approached most closely by the esters of p-hydroxybenzoic acid. Considerations of color, odor, low acute and chronic toxicity (10), lack of undesirable allergenic behavior, and the effectiveness in low concentrations against commonly-occurring cosmetic microorganisms indicate the p-hydroxybenzoate esters to be the preservative of choice.

REFERENCES

(1) Gershenfeld, L., and Peristein, D.: Am. J. Pharm. 111, 227 (1939)
(2) Sabalitschka, h.: Pharm. Monatsh. 5, 235 (1924); Z. Angew. Chem. 37, 811 (1924); Apoth. Ztg. 48, 703 (1924); Pharm. Zt. Zt. 69, 1018 (1924)
(3) Neidig, C. P., and Burrell, H.: Drug & Cos. Ind. 54, 408 (1944)
(4) Sagarin, E.: "Cosmetics-Science and Technology", Chapter 43, pages 1034-74, Interscience Publishers, Inc., New York (1957)
(5) Aalto, T. R., Firman, M. C., and Rigler, N. E.: J. Am. Pharm. Assoc. (Sci. Ed.) 42, 449 (1953)
(6) Sokol, H.: Drug Standards 20, 89 (1952)
(7) de Navarre, M. G.: Am. Perf. 63, 341 (1954)
(8) de Navarre, M. G., and Bailey, H. E., J. Soc. Cosmetic Chemists 7, 427 (1956)
(9) Patel, N. K., and Kostenbauder, H. B.: J. Am. Pharm. Assoc. (Sci. Ed.) 47, 289 (1958)
(10) Matthews, C., Davidson, J., Bauer, E., Morrison, J. L., and Richardson, A. P.: J. Am. Pharm. Assoc. (Sci. Ed.) 45, 260 (1956)

ANOTHER AMERICAN PERFUMER
AP
DOCUMENTARY
METHODS • PRACTICE • PROCEDURE

Combination of the ESTERS of PARA-HYDROXYBENZOIC ACID

ERICH BOEHM PH.D., F.R.I.C.

The microbiological activity of the esters of para hydroxybenzoic acid was discovered by Boehm and Sabalitschka (1) more than thirty years ago. The early studies with these substances showed that whilst each ester was active against a number of micro-organisms, it was also somewhat selective in its bacteriostatic and fungistatic action. Carefully formulated mixtures of the esters therefore show a broader spectrum of microbiological activity than their constituent parts. This point is very simply illustrated in the preservation of sugar solutions. Methyl p-hydroxybenzoate will prevent mould development in concentrated sugar solutions but it will not suppress fermentation by yeasts even in dilute sugar solutions. The propyl ester, on the other hand, is a powerful inhibitor of these fermentative processes. To protect sugar solutions from moulds and yeasts one needs to add the methyl and the propyl esters at suitable concentration levels.

Cosmetic products which show a simple microbiological picture may be preserved by a single ester of the series, provided the right one is chosen and used at an effective concentration. But those products which present a complex microbiological picture involving a mixture of moulds, yeasts and bacteria can only be adequately preserved by a carefully balanced mixture of these preservatives.

Another important aspect of the ester combinations is that they exhibit a greater preservative action than the sum of the activities of their component parts. Husa (2) has referred to this increased activity as a "potentizing action."

Bacterial studies with the esters of para hydroxybenzoic acid have shown that their activity increases with increasing length of the alkyl chain. This increased activity of the higher members of the series is to some extent offset by their lower solubility in water. Combinations of the esters provide a means of "breaking through" this solubility barrier. It is known that the esters of para hydroxybenzoic acid only slightly influence each others solubility in water. By carefully formulating ester combinations it is therefore possible to bring into solution relatively high concentrations of the most active esters together with moderately high concentrations of the other esters. The total active preservative concentration available from an ester combination is therefore higher than that obtainable from an individual ester.

All these claims are substantially confirmed by the published report of many investigators. To cite a few examples. Schimmel and Husa (3) found that one of the most effective preservatives of Simple Syrup U.S.P. and diluted syrup was a mixture of the methyl, ethyl, propyl, butyl and benzyl esters in the proportions 15:15:15:15:40 at a concentration of 1 in 7,500. Lawrence (4) showed that a mixture of 0.16% methyl ester and 0.02% propyl ester was effective against strains of Pseudomonas and Proteus in experimentally contaminated ophthalmic solutions. The American Food and Drug Administration advise the use of 0.18% methyl ester and 0.02% propyl ester for the preservation of aqueous suspensions of procaine penicillin. In this case, the combination is required to function as a mould inhibitor, antobacterial activity is provided by the presence of penicillin.

In the cosmetic field, ester combinations have been recommended by Gottfried (5) for the preservation of cold creams, hair oils, skin ointments, aqueous starch pastes and gum mucilages. According to Aalto, Firman and Rigler (6) combinations of the lower and higher p-hydroxybenzoates were particularly effective in a Karaya gum wave set and mineral and stearic acid hand lotions of typical formulation. They also suggest that

whilst cosmetic products of different compositions might require higher concentrations of preservatives, these would be readily obtainable with ester combinations.

The need for commercially available, compounded mixtures of the esters of p-hydroxybenzoic acid to meet the requirements of different products and various industries has grown with the years. In formulating these combinations it should be borne in mind, that whilst the number of possible mixtures is infinite, the formulation of an effective, economic combination for specific purposes requires a detailed knowledge of the physical, bacteriological and physiological properties of the esters and a wide experience of their application to a large number of products.

Four commercially available combinations were extensively investigated by Boehm and Jones (7). They were "Nipa 64," "Nipasept," "Nipa 82121" and "Nipa 82123." The first, a mixture of the more active esters of the p-hydroxy series was shown to be effective against bakers' yeast and killed resistant strains of Candida in 30-60 minutes, Proteus in less than 30 minutes and Staphylococcus in less than 4 hours. It was less reliable against B.coli. Nipa 64 has a positive solubility in mineral oils and has been recommended for the antiseptic treatment of paraffin wax papers, corks, liners and similar products. Nipasept, a mixture of three esters of the series, in its maximum aqueous concentration of 0.2% was effective against Gram-negative bacteria which were killed in 1-2 hours. This combination having an increased range of activity against micro-organisms has been recommended for eye-drops, eye lotions and parenteral injections. Nipa 82121 and Nipa 82123 are mixtures of five esters. They proved to be the most powerful combinations. Nipa 82121 was singled out for special mention as it was found to give the best "all round" performance and had a higher aqueous solubility than "82123." At its maximum concentration, 0.14%, "Nipa 82121" killed within 30 minutes, all the test organisms, which included Candida albicans, Staphylococcus, Bacterium coli, Proteus and Pyocyanea.

Wedderburn's (8) recent investigation of the influence of nonionics (2%) on Nipa 82121 (0.15%) is of interest. Her work shows that this ester combination is not adversely affected by non-surface active nonionics, such as glycerin, sorbitol, propylene glycol and tallow and is only slightly influenced by polyethylene glycols. Although surfactant non-ionics restricted the activity of Nipa 82121 only the most powerful inactivated it completely.

To summarize, the advantages offered by ester combinations are threefold; they have a broader spectrum of activity against various micro-organisms, they are more powerful in action, and they have a greater preservative potential than individual esters. These conclusions have been confirmed in industrial practice. Ester combinations are particularly suitable for cosmetics and for those industries concerned with the preservation and manufacture of quality products.

AMERICA'S HEADQUARTERS
for
PRESERVATIVES

p-HYDROXYBENZOATES	(Methyl & Propyl Esters and their water-soluble Sodium salts)
DEHYDROACETATES	(Acid and Sodium)
PROPIONATES	(Calcium and Sodium)
QUATERNARIES	(such as powdered CETRIMIDE Cetyltrimethylammonium Bromide)
p-CHLOR-m-CRESOL	(and Sodium salt)
CHLORPHENESIN	(p-chlorophenylpropanediol)

Ask for our ***FREE*** *preservative data sheet and request our advice to solve your difficult preservation problems.*

CHEMO PURO MFG. CORP.
150 DOREMUS AVENUE, NEWARK 5, N.J.

REFERENCES

(1) Sebelitschka and Boehm, Pharm. Monatsh. 5, 235 (1924); Pharm. Ztg., 71, 834 (1926); Pharm. Ztg., 71, 496 (1926); Arch. D. Pharm., 40, 653 (1930); Pharm., Acta Helelicae 5, 286 (1930); Chemiker Ztg., 54, 724 (1930).

(2) Littlejohn and Husa, J. Amer. Pharm. Assoc., 44, 305 (1955).

(3) Schimmel and Husa, J. Amer. Pharm. Assoc., 45, 204 (1956).

(4) Lawrence, J. Amer. Pharm. Assoc., 44, 457 (1955.)

(5) Gottfried, Perfumery Essential Oil Record, 37, 93 (1946).

(6) Aalto, Firman and Rigler, J. Amer. Pharm. Assoc., 42, 449 (1953).

(7) Boehm and Jones, J. Soc. Cosmetic Chem., 8, 1 (1957).

(8) Wedderburn, J. Soc. Cosmetic Chem., 8, 210 (1958).

For CREAMS, LOTIONS, SPRAYS and POWDERS:

CHLORHYDROL

(aluminum chlorhydroxide complex)

Available in 5 forms . . . granular, fine, medium, impalpable, 50% W/W solution.

For GELS:

CHLORHYDROL S-5

(aluminum chlorhydroxide complex—modified)

In solid form for alcohol type . . . grease and gum free gels.

For STICKS:

CHLORACEL

(sodium aluminum chlorhydroxy lactate complex)

Available as a 40% W/W solution for use in making Cologne type sticks.

REHEIS ANTI-PERSPIRANT CHEMICALS OFFER ALL THESE ADVANTAGES

- effective anti-perspirant action
- fine deodorant qualities
- non-destructive to fabrics
- non-irritating to skin
- no buffering required

Write for free data and samples

FINE REHEIS CHEMICALS

REHEIS COMPANY, INC.

Manufacturers of Fine Chemicals

BERKELEY HEIGHTS · NEW JERSEY

3560

ANOTHER AMERICAN PERFUMER
AP
DOCUMENTARY
METHODS • PRACTICE • PROCEDURE

U.S. Patent No. 2,379,294

SORBIC ACID

Sorbic acid so useful in food preservation is also of use in inhibiting mold growth in cosmetics . . . Physical properties and activity against organisms . . . Concentration and pH necessary to inhibit a few of the commoner microrganisms.

M. G. deNAVARRE

So often work originating in the food industry finds ramifications in cosmetic practice. Sorbic acid is one such material. Its use to prevent mold growth is covered by U. S. Patent No. 2,379,294, held by the Best Foods, Inc. Licenses under this patent are available.

Sorbic acid is considered safe for use in food processing because it is metabolized much the same way as are caproic and butyric acids which are natural to butter.

However, the use of a preservative in a food product must still be cleared with the Food and Drug Administration and the discussion given here is no license to do so.

The data presented here have been gleaned from manufacturers' literature and from special data submitted by the pharmaceutical section of the Charles Pfizer & Co., Inc., as well as from the data sheets of Union Carbide Chemicals Co., which also makes and sells this product.

Physical Properties of Sorbic Acid:*

Melting point	134.5°C.
Solubility	Very slightly soluble in cold water; more soluble in hot water, freely soluble in alcohol or ether.
Molecular weight	112.12
Formula	$C_6H_8O_2$
Ionization constant at 25°C.	1.73×10^{-5}

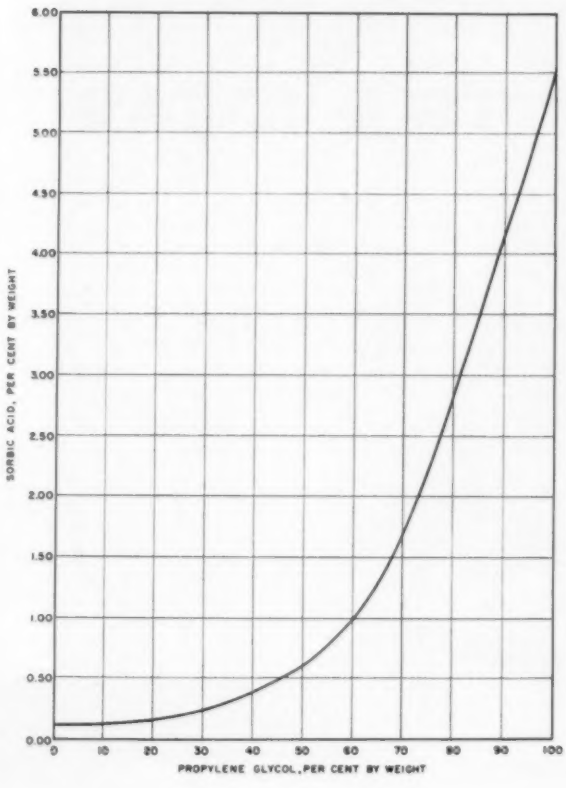
SOLUBILITY IN VARIOUS SOLVENTS*
(per cent by weight at 20°C.)

Acetone	9.2
Ethanol, Anhydrous	12.90
Ethanol-Water Solutions,	
1 per cent Ethanol	0.14
5 per cent Ethanol	0.16
20 per cent Ethanol	0.29
Glycerol	0.31
Isopropanol	8.4

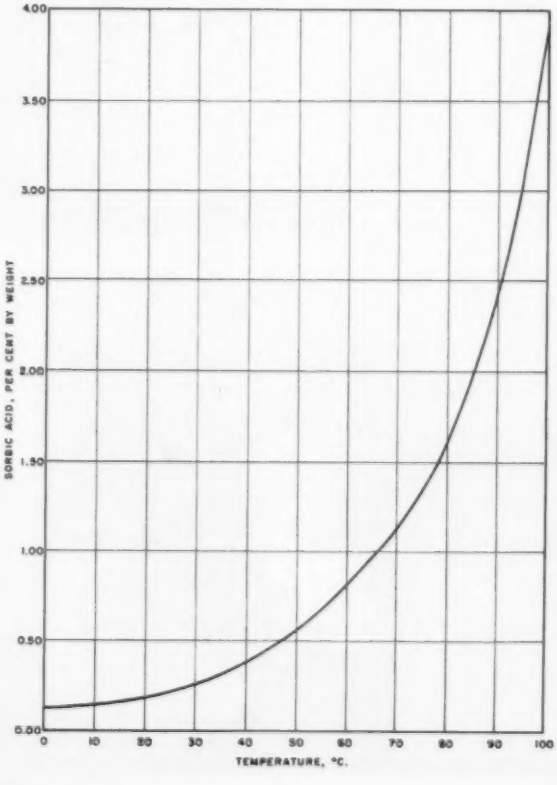
* Union Carbide Chemicals Co. (F-8526A)

Sorbistat (sorbic acid, Pfizer) is a selective growth inhibitor for many molds and yeasts and certain bacteria.

SOLUBILITY IN PROPYLENE GLYCOL-WATER SOLUTIONS AT 20°C.



SOLUBILITY IN WATER, 0 TO 100°C.



It appears to inhibit mold growths owing to its unsaturated fatty acid structure, which is similar to the products of the enzymatic dehydrogenation reaction. Sorbic acid is a white fluffy crystalline powder with a mildly acid odor.

In general, sorbic acid is most effective at pH 5 to 6 or below. *In vitro* tests on the activity of sorbic acid against various molds, yeasts and certain bacteria are not at all indicative of the *in vivo* activity. The preservative efficiency of sorbic acid is directly related to its degree of dissociation which in turn is directly related to the pH of the medium. Seventy per cent of the sorbic acid is undissociated at pH 4.4 and at this pH, there is little or no microbial growth as compared to controls at pH 7.0 where inhibition is negligible, to absent, less than 1 per cent is undissociated.

The effective concentration varies widely, depending on the organism to be inhibited. The table below lists a few of the microorganisms inhibited, the concentration and pH necessary to do so.

Activity of Sorbic Acid Against Organisms

Organism	Concentration To Inhibit Growth	pH
1. Candida Albicans	0.1 %	4.5
2. Penicillium Chrysogenum	0.15%	3.5
3. Aspergillus Niger	0.05%	2.5
	0.15%	3.5
4. Rhizopus Nigricans	0.1 %	4.5
5. Saccharomyces Pastorianus	0.1 %	6.0
6. Torulaspora Rosei	0.1 %	5.0
7. Pseudomonas Aeruginosa	0.2 %	—
8. Proteus Vulgaris	0.15%	—
9. Escherichia Coli	0.12%	5.0-5.5
10. Bacillus Subtilis	0.15%	5.6-7.0
11. Staphylococcus Aureus	0.12%	5.0-5.5
12. Streptococcus Faecalis	0.12%	5.0-5.5

Sorbistat K (potassium sorbate, Pfizer) is the anhydrous, water-soluble, potassium salt of sorbic acid. In acid media potassium sorbate hydrolyzes to the active acid form and inhibits growth of most yeasts and molds, as well as of certain bacteria.

Physical Properties of Sorbistat K

Formula	$C_6H_7O_2K$
Molecular Weight	150.22
Solubility, 25°C.	
water	greater than 40 g/100 ml.

Esters of sorbic acid in general are poorly water soluble but are useful for impregnating paper for example. A few have been made and studied.

Ester of Sorbic Acid

Ethyl sorbate — Propyl sorbate
Butyl sorbate — Decyl sorbate
Lauryl sorbate

The activity of these esters were all lower than sorbic acid's activity and offering no other advantages, additional work was curtailed.

Acknowledgments

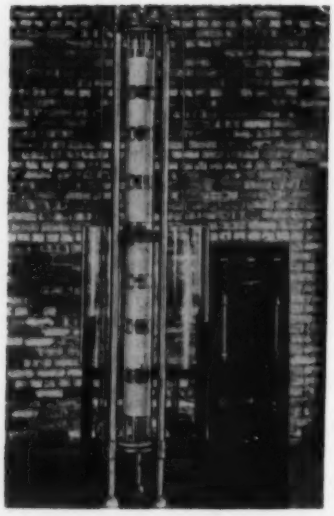
The data submitted by Herbert Thompson, Jr., of the pharmaceutical section of the Charles Pfizer & Co., Inc., is hereby acknowledged. Most of this paper was based on data supplied by him.

Acknowledgment is also made of material taken from Bulletin F-8526A of Union Carbide Chemicals Co. on sorbic acid showing the solubility of the material in various solvents as well as two graphs showing its solubility in water and in water-propylene glycol solutions.

CAUTION: A report has appeared in the literature indicating that sorbic acid used as a preservative in certain preparations may have a sensitizing potential. The work reported is not of sufficient magnitude to draw any conclusions. It is therefore suggested that anyone contemplating the use of sorbic acid as a preservative should make the necessary dermatological test to determine its safety.

(Fryklof, Lars-Einar, "A note on the Irritant Properties of Sorbic Acid in Ointments and Creams," *J. Pharm. Pharmacol.*, 10, 719, 1958).

New PRODUCTS & IDEAS



1.

EXTRACTION PLANT—1

The Podbielniak Spiradyne Column Extraction Plant is being offered as a completely engineered "packaged assembly." It consists of a gravity-type column specially designed with highly-efficient impeller mixing sections for intimate contacting of two phases. The sections are assembled on a rotating shaft controlled by a variable speed drive unit. The clarification sections embody principles used in Podbielniak Contactors. Sufficient mixing and clarifying sections can be combined in a single unit to provide a range of definitely "identifiable" stages as may be required, according to the firm.

LOW-TEMPERATURE REFRIGERATING SYSTEM—2

A new Norelco low-temperature refrigerating system, designed for temperatures in the range from minus 20 degrees F to minus 260 degrees F, has been announced by the Instruments Division, Philips Electronics, Inc. The environmental chamber provides 13 cubic feet of space for low-temperature tests and processes in a cabinet whose external measurements are 48 in. length, 40 in. width, and 52 in. height. All cabinet walls are thermally insulated to assure minimum heat loss. Water requirements are from 3 to 4 gallons per minute at 35 pounds per square inch pressure and maximum temperature of 85 degrees F.

3.

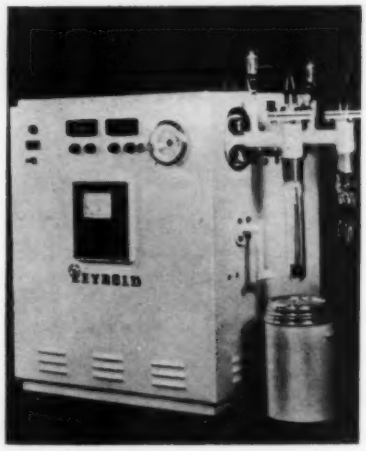
MOISTURE DETERMINATION BALANCE—3

The Ohaus Model #6000 Moisture Determination Balance is, according to the manufacturer, a completely self-contained unit comprising a magnetically damped analytical-type chain balance as the weighing system, combined with an infrared heating element which provides even concentrated heat to the sample in a specially designed heating chamber. In use, the sample of material is heated and dried, and by setting a single dial, the amount of moisture can be read directly at any time during the adjustable pre-set time cycle. The stabilized pan enables this balance to be used with liquids as well as solid and pulverized materials.

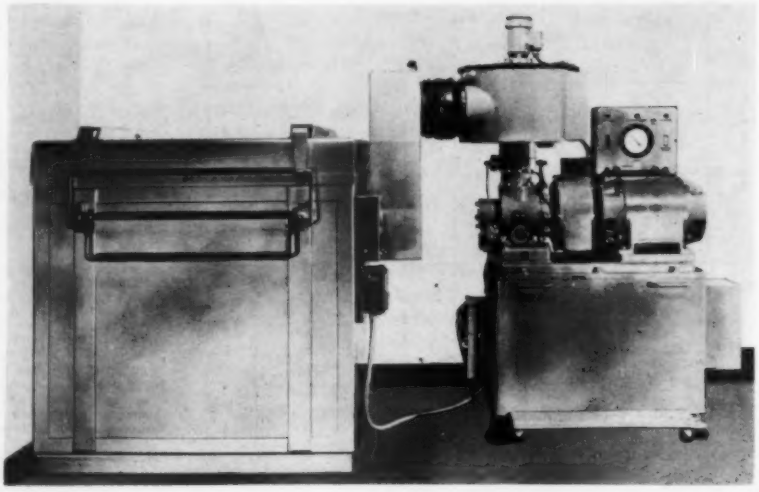
FREEZE-DRYER—4

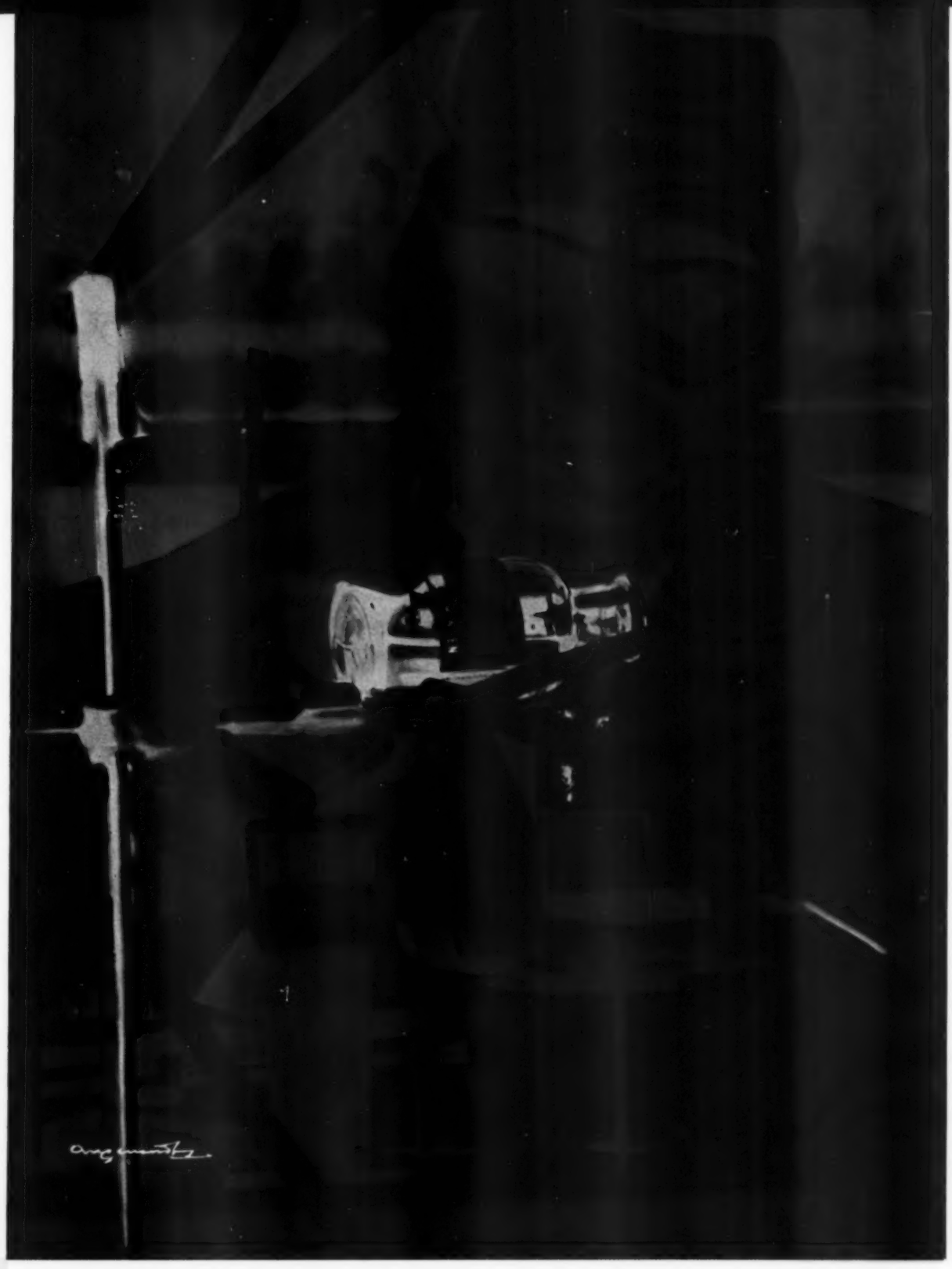
The Leybold Freeze-Dryer can reportedly remove water vapor directly with two unique pumps and thereby eliminate the need for condensing apparatus or absorbing media in laboratory freeze-drying operations. The Freeze-Dryer combines in series, the Leybold Rotary Gas Ballast Pump and the Leybold high-speed, high vacuum diffusion pump.

4.



2.





Exploring the Secrets of Nature

Applying new scientific knowledge to develop synthetic aromatics hitherto unknown
Re-creating, synthetically, precious natural distillates and extracts
These are problems successfully mastered by our research chemists and perfumers.*
Experiences thus gained inspire to further DRAGOCO ACHIEVEMENTS

***BULGARYOL** synthetic Bulgarian rose oil
NEROLYOL synthetic Neroli oil blg. pat.
BIGARADIA perfect reproduction of «Absolu de Fleurs d'Oranger»

DRAGOCO INC. NEW YORK

200 WEST BROADWAY, NEW YORK 13, N. Y. · TEL. CAnal 6—5813/15

Mayor of Milan, Virgilio Ferrari, shaking hands with SCC President Baker

President Baker tours Durban's plant in Milan with Count Franco Cella di Rivara and daughter

Dr. Paul Rovesti, left, and James Baker listen to host, Count Franco Cella di Rivara, while Henry van Ameringen looks on from the right background

1958

S.C.C. TOUR

conclusion

General view at Esperis reception in Milan

The group at Polak & Schwarz, Hilversum, listens to an address by the Burgomaester

Indonesian Dinner

This was an experience! An all Indonesian dinner (except for refreshments). It was a ricetable. We started with Nasi Poetik and ended with Pisang Goreng (fried banana). The Sambal Goreng Ati looked good —but was hotter than the hinges of ———! The Ajarn Goreng and the Sate Madura I enjoyed. By the time I got to the Mata Sapi (fried egg) it was different from any egg I ever ate. As for the Kroepoek Oedang—a crisp biscuit made from rice flour and crushed shrimp—well, I don't care much for anything that lives in water. I was watching the Jellineks use the various Sambals (red pepper). They really seemed to enjoy it. My Canadian friend Jack Quigg who claims his curries are never quite hot enough, thought the meal "warming" but not hot.

Next morning one common observation. Hot tummy and hot pipes—and cold water so hard to get. Well, Joe, you wanted us to have an unusual experience and it was. No upset stomachs—one could say a hot time was had by all.

On this day Friday we were guests of Polak Frutal Works of Amersfoort. Our bus left late in the morning. We were to see some of Holland—to understand it and its people better; and we did. We were joined by Herr J. Meihuizen managing director of Polak's Dutch division and his lovely lady.

Mr. P. Schwarz, center, laughing at Mr. Van Roon's story

Our first stop was at De Driesprong, a charming watersport hotel. Here we had piping hot coffee and a tasty loaf cake. Then for a trip on one of the dykes on the Zuider Zee, a boat ride on one of the lakes with a tasty

The tour group in the flavor laboratory at Polak & Schwarz at Hilversum

A group of Dutch Cosmetic Chemists gathered at Polak & Schwarz plant at Hilversum, Holland

pre-packed lunch of several different kinds of sandwiches, cheeses, fruit, cookies and coffee. After lunch the sun came out. What an unusual series of pictures we all took. Back to the dock and on our way to the State Museum in the National Park de Hoge Velume. This is the above sea level area of Holland (about half of the people of Holland live below sea level) with sand dunes and picturesque pines. The Kröller-Muller Foundation owns 272 of the works of Vincent van Gogh, many of which were on display. Though impressive, my own taste doesn't run to impressionism—and Van Gogh is a good example of this school of art. To appreciate it, one has to put himself in the painter's place and learn why he altered what he saw to that on the canvas.

Well, here was a place, too, for the first time on the tour when some of the ladies mistook "Heren" for "Hers." I guess it was a form of expressionism.

Back to the bus and to a most delightful restaurant for tea under the trees . . . a relaxing setting! The leaves on the trees were just turning—the fall colors were everywhere to be seen. Chatted considerably while sipping tea, with the young Jellinek (a Polak Frutal Works' chemist-perfumer) about his paper given at Bonn. He had spent some time in North America and would be coming to the States again, soon.

On the bus again, this time slowly heading for Amersfoort. We slowly drove past the Polak factory, around the town and to the De Witte Hotel for cocktails and a banquet. Mr. Meihuizen introduced me to Dutch gin, *straight*, a refreshment I had mentally always assigned to more stalwart men than I. Gin always reminds me of Prohibition days. But what an interesting surprise? One could hardly tell it was gin as we know it.

Part of our group who couldn't be with us, now joined us for more refreshment. The private dining room awaited us. Soft lights and Royal Dutch decor. Our menu was arranged on perfume blotters, one blotter for each course. Very original!! It consisted of: Crabmeat Cocktail, Consomme Double, Sole Veronique, Piesporter Tauhengarten, Parfait Havanise, Mocca.

A warming hope that their efforts to show us a bit of Holland in a relaxing way were Mr. Meihuizen's brief sentiments. S. C. C. president Baker assured our host that he and his company had achieved their goal. It was a comfortable, homey day without pressures.

Back to Amsterdam to prepare for the next leg of our trip. We left for Brussels on Scandanavian Flight 551, arriving at the new Brussels Airport at 2:00 p.m. Our hostelry—all but the Quiggs who stayed at the Plaza where we were originally scheduled to stay—was the Park Motel, a place put up especially for the World's Fair, to be taken down afterward.

Must I say more? Oh, yes, there were mosquitoes, too—millions of them in the rooms. We hurried to get ready for a group representing the Société Belge de Cosmétology who were expected to arrive at 5:00 p.m. The Bakers, Kramers, Strianses and deNavarres were to be their guests that night.

Our Belgian friends were early. Among them were Messrs. G. Dumont, Hugo Collumbien and their ladies, president Gui Dony, Dr. A. Mareel and M. Swaeles. We broke up into three carloads. Mme. Collumbien, Jeanette and I rode with Dr. Mareel, who made his Mercedes Benz do tricks on the Petite Cienture out to the Auberge de la Becasse Blanche (White Snipe) where we enjoyed a refreshing glass of beer at the sidewalk tables. A bird's-eye view among the major highspots in Brussels, then to the Maison des Ailes, a private club for air force officers. A spot of refreshment during which time we met others of the Belgian group, namely F. Pelletier and E. Jean and their ladies. Hugo Collumbien sat at my right. The tasty soup was creamed chervil, Filet Mignon au Poivre served still flaming from the chafing dish —and flaming all the way down—but good. A lovely red wine, but I don't know which; dessert and liqueur.

Belgian Society of Cosmetic Chemists

And then we got down to business. A lively discussion between Messrs. Strianse, Swaeles, Marriott, Dumont, Baker and deNavarre followed. President Dony put the

motion to his directors who were present to rename their society as the Belgian Society of Cosmetic Chemists. It was unanimously accepted. The first order of business by president Dony was to present honorary memberships in the new society to our Messrs. Baker and Strianse. This unexpected gesture caught them both unawares but president Baker regained his composure and thanked the directors and president Dony for both.

After the meeting broke up, all of us went down to the market square to see the illuminated buildings painted in gold and other rich colors. It is one of the sights that one will remember forever. Dr. Mareel took us back to the Park Motel.

Sunday we agreed to meet the Quiggs at the Vatican Building at the World's Fair at 11:00 a.m., after attending Mass there. So we did. The day looked ominous. I alone had a raincoat.

Brussels Fair

To the U. S. Building first—for coffee and a "typical" Yankee hot dog. Darn near got killed trying to walk through the full-wall-one-piece mirror. Then we "did" the whole building . . . and the Russian Building. Bought a few real Russian souvenirs. By now it was raining heavily. We decided on dinner in the Canadian Building, just up and behind the Russian Building. As we were leaving the main entrance in front of the mammoth statue of Lenin, it began to pour like a cloudburst. Everyone was seeking shelter as we were trying to get out. Now I know what it is to be caught in a panicked crowd.

We made it—but all were drenched except I. After dinner the sun came out. We went into the French Building, saw the perfumery displays, to the picturesque Thailand temple, the Norwegian and Swedish Buildings and decided we had enough.

Dinner at the Plaza—we were so weary I don't remember what we ate. Soothing music. Back to the motel to fight mosquitoes again. Our room was next to the Kramers. We could hear each other swatting the devils all over the walls.

Monday morning the group toured the city, ending in the market square for daylight pictures and Belgian laces.

We lunched at the Rotisserie Ardenaise on the Boulevard Max, a real old timer with lots of atmosphere in their three dining rooms. After which Jack Quigg and I went back to the Fair to go over the U. S. and Russian buildings once more. I was pleased with our building though I cannot say everything I saw was typical. The lavatories in the U. S. Building were the only ones at the Fair with a No Tipping sign.

Gerry Kakehashi had told me about some sidewalk spots at the Fair selling sausage, sauerkraut and beer. We found one. The place selling Lowenbrow—a stein of beer, a grilled bratwurst in a chewy roll with well cooked sauerkraut for garnishment for 35 Belgian francs. That is living, too! Got some World's Fair covers with various new stamps on them for myself and philatelic friends.

Tuesday we started packing to be ready for the BEA Flight 435 which would take a large part of the tour group to London, some to make connections that night for New York, but the Strianses, Marriotts, Quiggs and deNavarres were staying in London. Another group, composed of Jim and Stevie Baker, Phil Spaeth, Carroll and Gladie Reiss, Warren Van Wyck and Bart and Dorothy Owells went to Paris for a fling. The Loudens and Horseys stayed behind.

We arrived in London during one of the heaviest rains in years, followed by floods throughout the area.

At Claridges we were really "living" for the next four days. The only thing comparable to our rooms were at the Petersburg at Bonn.

I was here principally on business, but managed to see a few people in between working hours. Among them was Dr. Ludwig Salfeld (Helena Rubinstein); A. Herzka (The Metal Box Co.) who is also Honorable editor of the British Edition of the S. C. C. Journal; the John Cliffords and Col. Max Spicer (Beauty Counselors of London, Ltd.); the whole Pickthall family including Terry and Michael; Freddy Wells, editor of our British contemporary *Soap, Perfumery and Cosmetics;* and Baron Langley (W. J. Bush and Co., Ltd.), the Jack Quiggs who were finishing up his business for Compagnie Parento, Ltd., and en route home to Toronto; the Strianses who were in London on behalf of Shulton; Reggie Warner (John Gosnell, Ltd.) and Bart and Dorothy Owells who didn't have too good a time in Paris.

Between the Helenka (Helenca?), Colony, Marcel's in Knightsbridge, Caprice, Bentley's and Charco's, we covered a variety of eating places in London, not to forget Claridge's two dining spots.

We left London Sunday night at 7:30, stopped at Shannon (V. O. $2.50 per fifth; Benedictine $3.50 full bottle, etc.) and got off at 6:00 a.m. in Detroit.

Three weeks in Europe convinces me that the "average man" as we know him in the U. S. A. has a tough time. Everything is expensive in the shops. Yet, no one looks shabby or hungry in the cities we visited. More and more people in all countries speak English. We were most cordially received wherever we went and entertained regally by our many hosts.

The S. C. C. had a successful tour of seminars with a lot of new, original ideas popping up in the different countries. The S. C. C. in the U. S. A., Great Britain, Denmark, Switzerland and Germany is now joined by the Belgian group. Sister societies in Holland, Italy, France, Spain, Canada, yes, even India are in the different stages of conception. Let us pray the leadership inspired by the Society of Cosmetic Chemists of Great Britain and the United States shall not be wanting on this eve of great happenings throughout the civilized world of cosmetic science.

"My wife wants to know the name of the perfume you use on the elephant!"

IMPORTANT BOOKS YOU CAN USE TO IMPROVE EFFICIENCY & INCREASE PROFITS!

THE HANDBOOK OF SOLVENTS.

By Leopold Scheflan and Morris Jacobs. The most useful reference work on solvents available today. The properties, uses, action and technology of solvents are covered in this comprehensive handbook. Two major sections: 1. Covers theoretical aspects and practical attributes of solvents such as solvent action, solvent power, evaporation and evaporation rates and limits of inflammability. Discusses in detail solvent recovery, stresses safe practices; 2. The physical constants of over 2,700 liquid compounds are tabulated. Arrangement such that you can compare, at a glance, the so-called literature constants with the commercial constants of each solvent. 728 pp., 7 x 10, 17 illus. $10.25 postpaid.

SOAPS AND DETERGENTS.

By E. G. Thomssen, Ph.D. and J. W. McCutcheon, M.A., D.C.I.C. A volume for the practical soap maker. Synthetic detergents thoroughly discussed. Tabulates 250 surface active agents, their classification, trade names, manufacturers and application in the soap industry. Covers continuous soap making processes, soap perfuming and coloring, equipment, processes and methods. Up-to-date, authoritative, 511 pp., 66 illus. $9.25 postpaid.

MANUAL FOR THE ESSENCE INDUSTRY.

By Erich Walter. Comprises modern methods with formulas for making all kinds of essences for liquors and alcoholic drinks, fruit juices and jams, mineral waters, essences of fruits and other vegetable raw materials, essences for confectionery and pastry. Describes raw materials and laboratory practice. Discusses taste and the transfer of flavor to foods and beverages. A standard work for many years. Contains 427 pages, 37 illustrations. $8.25 postpaid.

PERFUMERY SYNTHETICS AND ISOLATES.

By Paul Z. Bedoukian, Ph.D. This carefully compiled volume supplies a genuinely felt want for authoritative data on perfumery synthetics. The work contains the history, chemistry, physical and chemical properties, manufacture, uses, and other pertinent data of the principal perfumery compounds; and covers the important perfumery synthetics. A complete index adds to the value of this useful book. 488 pages. $9.25.

HENLEY'S 20TH CENTURY BOOK OF FORMULAS, PROCESSES, TRADE SECRETS—REVISED, ENLARGED EDITION.

Includes new section on Plastics and Photography. Manufacturers, Chemists and others call HENLEY'S the most valuable book of its kind. Nearly 10,000 formulas, processes, trade secrets. It contains formulas for nearly everything imaginable; new ways of doing things; technical process; so-called trade secrets. It has helped thousands make more from their present businesses and professions. A single formula may be worth more than 100 times the price of the book. Over 900 pages, completely indexed, cloth binding, $5.25 postpaid.

HANDBOOK OF COSMETIC MATERIALS.

Their properties, Uses, and Toxic and Dermatologic Actions. By Leon Greenburg & David Lester. With a chapter on The Skin by Howard W. Haggard. Contains alphabetical listing, with frequent cross references, of information on approximately 1,000 substances. For each compound gives: Formula (including collateral names); Properties; Uses, Toxic Action; Dermatologic action. Exhaustive bibliography. Essential for Manufacturing Chemists, Cosmetic Industry, Chemical Specialties Industry, Dermatologists, Allergists, Industrial Hygienists. Published 1954. 467 pp. $12.75 postpaid.

COSMETICS—THEIR PRINCIPLES & PRACTICES.

By Ralph G. Harry. No other book in this field gives such a combined wealth of medical and technical data on every phase of the subject. To mention but a few examples, it discusses the skin, its nutrition and scientific care; the hair, its proper grooming, the physicochemical problems involved in its washing, and the potential hazards to the eye mucosa of the use of some detergents; the teeth and their care, covering the present status of antibiotic, antienzymic, ammonium-ion and chlorophyll dentifrices, and the luster-producing properties of toothpaste ingredients, etc. Much of the information in the book has its source in the research activities of the well-known author, which date back for many years and embrace the fields of chemistry, dermatology and microbiology. 786 pages, 120 illustrations (some in full color), 1956, $17.25 postpaid.

THE ESSENTIAL OILS.

By Ernest Guenther, Ph.D. This monumental six-volume work is comprehensive, authentic. VOL. I covers: Origin and Development of Essential Oil Industry, Chemistry and Function of Essential Oils in Plant Life, Products of Essential Oils. 448 pp., $8.50 postpaid . . . VOL. II gives detailed data on several hundred of the more important constituents of essential oils. 852 pp. $12.50 postpaid . . . VOL. III describes the oils of plant families Rutaceae (with special emphasis on citrus oils) and Labiate. 777 pp., $12.50 postpaid . . . VOL. IV covers the individual oils in six plant families not covered in Vol. III. 752 pp., $12.50 postpaid . . . VOL. V is of special importance to the flavor chemist. 507 pp., $12.50 postpaid . . . VOL. VI, the final volume, is of interest to the pharmaceutical, flavor, and perfume industries. Features wintergreen, sweet birch, valerian, mustard, onion, hops, etc. Also deals with pine oils and turpentine. Includes table showing the taxonomic classification of all the essential oils described in all six volumes. 481 pp., $12.50 postpaid.

Moore Publishing Co., Book Division, 48 West 38th St., New York 18, N. Y., U.S.A.

Please send me the books checked at right. I enclose check or money order for: $.....

Name .....

Company .....

Street .....

City .....

State or Country .....

- ☐ The Handbook of Solvents $10.25
- ☐ Soaps and Detergents .....$ 9.25
- ☐ Manual for the Essence Industry .....$ 8.25
- ☐ Perfumery Synthetics & Isolates .....$ 9.25
- ☐ Henley's 20th Century Formulas .....$ 5.25
- ☐ Handbook of Cosmetic Materials $12.75
- ☐ Cosmetics—Principles & Practices $17.25
- ☐ The Essential Oils, Volume I .....$ 8.50
- ☐ The Essential Oils, Volume II $12.50
- ☐ The Essential Oils, Volume III $12.50
- ☐ The Essential Oils, Volume IV $12.50
- ☐ The Essential Oils, Volume V $12.50
- ☐ The Essential Oils, Volume VI $12.50

For Finer Fragrance . . .
Greater Dermatological Safety

CHEMODERMS *by* **FIRMENICH**

Seven years of original research have been rewarded by the discovery and development of a new group of controlled and reproducible perfume compositions for cosmetic and pharmaceutical products. We call them CHEMODERMS, for their chemical purity and dermatological safety. Exhaustive tests prove them free of primary irritants. Leaders in the treatment of allergies hail them as an important step in the elimination of sensitivity to perfumes. Now available in ten of the most desirable, panel-accepted fragrances. CHEMODERMS will enhance your next cosmetic creation, enlarge your markets, and enliven your presentations and promotions with vital and timely appeals.

FIRMENICH INCORPORATED

FIRMENICH & CIE
SUCCESSEURS DE
CHUIT NAEF & CIE
GENEVE SUISSE

250 WEST 18TH STREET, NEW YORK 11
FIRMENICH OF CANADA, LIMITED,
348 WALLACE AVENUE, TORONTO
CHICAGO OFFICE: 612 NORTH MICHIGAN AVENUE
LOS ANGELES, 1756 MALCOLM AVENUE
GENEVA PARIS LONDON

1

2

HOUBIGANT—1

Houbigant introduces a new spray perfume purser which hermetically seals Chantilly and Flatterie from the air and prevents evaporation and change. The purser contains a quarter ounce of perfume and holds over 300 measured sprays. Chantilly purser is priced at $3.75, with refill at $2.75. Flatterie purser is priced at $5.00, and refill at $4.00.

MILLOT—2

Millot has gift-wrapped a miniature flacon of Crepe de Chine perfume along with a one ounce miniature of their Eau de Cologne. Calling it "jewel-like miniatures", it's an exciting and welcome gift idea. The miniature package is being offered on a limited time basis at a price of $2.00 plus tax. The offer is from December 31 to April 1.

CHERAMY—3

Cheramy will promote its April Showers deodorant talc this Spring by giving a free rain bonnet with the purchase of each 35 cent can. The rain hat, with cross-grain ribbon, encased in a blue plastic pouch, regularly sells for 49 cents, according to the company. This special offer will be in effect January through March.

BOURJOIS—4

Packaged in a gold-coated, spill-proof fragrance container for the purse, the new "Perfume Essence" is further enhanced by a presentation package allowing complete visibility. Against a background of a pale blue foil beveled base rimmed in a deeper hue of the same color, a cover of heavy strength acetate protects and displays the container.

3

4

5

MENNEN—5

The Mennen Co. is planning a series of consumer offers for its Baby Products line. The first of these includes a free 4-ounce can of New Mennen Baby Powder with the purchase of the dollar size Baby Magic. The combination is packaged in a boot especially designed for limited shelf space in retail outlets.

6

NESTLE-LE MUR—6

Nestle has introduced Pearly Pink and Frosty Blue to its professional line of Streaks 'n' Tips. According to the manufacturer these latest additions to the line will not rub off or leave hair sticky, yet shampoo out easily. Both come in aerosols, for professional use.

7

PRINCESS MARCELLA BORGHESE—7

Another package which recently made its debut is the Collezione Luminosa cosmetic line created in Italy and distributed in the United States by Princess Marcella Borghese, Inc. The design is confined to gold-bronze printing and embossing of a filigree ornament on high-gloss white stock, embellished with the miniature, polychrome crest of this illustrious Italian family.

8

LEHN & FINK—8

A new Walt Disney Bubble Bath line for children features some of the best-loved characters created by the Disney studios. The line includes bubble-bath preparations in three types of packages: A series of four plastic dolls retailing at $1.00, molded as Mickey Mouse, Donald Duck, Pluto, and Dumbo; a canister with a puzzle game built into the cover at 89 cents; and the Sleeping Beauty series of packets in four fragrances, also selling for a dollar. The Sleeping Beauty package will tie directly with the new six million dollar Disney motion picture of that name.

"there's gold in them thar hills"

...and we mean sales gold in the new RICHFORD Metallic Finish

"GOLD NUGGET"

Here is beauty, quality, usefulness plus an iron-hard surface that laughs at scuff-marks, scratches and hard wear.

Available immediately from stock in all sizes of bottle caps in the well-known RICHFORD Flare, Futura and Square shapes and on other shapes to order. Also especially effective on our Exquisite Bottles as shown in standard and spillproof finishes.

Write NOW for samples and prices.

RICHFORD
CORPORATION

Offices and Plant:
3618 Oceanside Rd.
Oceanside, N. Y.

Showrooms:
Empire State Bldg.,
350 5th Ave., N. Y., N. Y.

News and Events

B. Spanjersberg Completes Forty Years with "Naarden"

B. Spanjersberg, the head of the perfumery and flavourings division of N. V. Chemische Fabriek "Naarden," completed forty years with the firm on November 18. To mark this special occasion the managing directors were "at home" to Mr. and Mrs. Spanjersberg. Later in the day there was a reception at which many friends from home and abroad availed themselves of the opportunity of congratulating the happy couple. The program of events was rounded off with a dinner given by the managing directors.

Sales Representative Honored By Fritzsche Brothers, Inc.

For the seventh time this year, and for the seventy-seventh time since its inception, the Quarter-of-a-Century Club of Fritzsche Brothers, Inc, honored a new member. Frank J. Stebbins, who joined the old New York essential oil firm on December 15, 1933, was feted at a luncheon celebration given him by the firm's officers and directors, who also presented him with a large denomination Government bond and an engrossed scroll to commemorate the occasion. Mr. Stebbins was also given a stereophonic hi-fi set and other gifts by his fellow employees and close associates in the Sales Division, of which he is a member.

Six Products Account for 80% of Pressurized Packages

Although over a hundred different types of products have been introduced in pressurized packages since 1946, six account for 80% of the annual aerosol production according to the latest survey of E. I. duPont deNemours & Co. Hair sprays and insecticides top the list with 45% of the nation's housewives having purchased one or more packages of such products in the last six months. Other products in the top half dozen in consumer popularity are room deodorants, shaving creams, colognes and paints and lacquers.

New Entry Into the Liquid Detergent Field

A new liquid detergent, called Bravo, in two sizes, 14 oz. and 26 oz. in plastic bottles has been launched by S. C. Johnson & Son, Racine, Wisc. The new household cleanser marks the company's entrance into the liquid detergent field.

The New Look of Hazel Bishop, Inc.

"The New Look" for Hazel Bishop which was promised by Robert G. Urban when he took over as president of the

Robert G. Urban

cosmetic firm less than three months ago, is reported to be well on its way to realization. The four pronged reorganizational campaign which Mr. Urban instituted immediately upon taking office has already resulted in major changes in the sales, advertising, product promotion and research phases of the Bishop operation. When Mr. Urban took office, late last summer, the Hazel Bishop sales staff had less than a half dozen men covering the entire country. Under Mr. Urban's leadership the sales staff has been increased to 52 men and it is his intention to add as many men as needed to service and promote Hazel Bishop throughout the United States. Seven divisions covering the entire country have been created, with a sales manager in charge of each. Another important phase of the Hazel Bishop face-lifting operation has been to redesign all packages. During the last few months, Mr. Urban said, the company has been taking back merchandise and replacing it with products that stress the new look of lushness and elegance that from now on will be a Hazel Bishop trademark.

Bathtub Chanel No. 5 Flunks Middleman Sniff Test

A free-lance perfumer known as Cue Ball Kelly was making batches of perfume (using the term loosely) in his bathtub in Brooklyn, aging it on the fire-escape and peddling it to bargain hunters for Christmas gifts. According to police, he had sold 15 gross of one-ounce bottles and expected to get rid of 60 gross more by Christmas Eve. The only trouble was that Cue Ball, otherwise known as Carl Zingale, was selling the stuff as Chanel No. 5, at the bargain price of $2 an ounce, according to police. He was picked up in McGirr's Billiard Academy after a cabbie who had bought 36 bottles of the phony Chanel No. 5 complained to the police that it just didn't smell right. Zingale was charged with mislabeling and counterfeiting a trade mark. Other perfumers may wish to consult Cue Ball on such subjects as Permeation of Porcelain, The Fire-Escape Aging Process, or Problems of Poolroom Marketing.

GIVAUDAN-DELAWANNA HONORS NEW 25-YEAR VETERANS

At the presentation of gold Swiss watches to new 25-year veterans, from left to right, Stephen Braun, Theodore Estes, H. F. Duffy, treasurer, Alphonse T. Fiore, E. R. Durrer, president, Matthew Sadecki John Wutsch and Dr. Max Luthy, vice president in charge of production. Miss Silvia Boggiano, another new 25-year veteran, was not present.

BRITISH AEROSOL EXPERT VISITS UNITED STATES

British Aerosol Chemist Tours Plant of G. Barr and Co.

British Aerosol chemist Alfred Herzka (right) studies containers for nitrogen-propelled aerosol dentifrices at G. Barr and Co., Chicago, during an in-plant tour conducted by George Barr, company president (left). Mr. Herzka, head of aerosol development projects for The Metal Box Co., Ltd. operation at Alperton, Middlesex, England, visited Barr's plant and laboratories during his tour in the U.S. to observe latest developments in pressure packaging technology and production. Mr. Herzka is co-author, along with Jack Pickthall, of Pressurized Packaging (Aerosols) published in the United States in December.

Flavor Chemists Addressed by Dr. Theimer, Hettiger, and Fiore

At the December 5 meeting of the Society of Flavor Chemists, Dr. Ernst Theimer, Van Ameringen-Haebler, Louis Hettiger, Trubek Laboratories, and Albert Fiore, Givaudan-Delawanna, discussed various aspects of aromatic chemicals as they pertain to the flavor industry. Their talks were followed by a lively discussion on how the Society might best contribute to a better understanding of the role of flavomatics in foods.

It was announced that at the next meeting on February 3, 1959, Dr. Edward Langenau, vice president, Fritzsche Brothers and Director of Analysis and Control Laboratory will discuss "Oleoresins of Interest to the Flavor Chemist."

To more adequately cover the use and sources of spices for flavoring Mr. Stefan Arctander, perfumer, Colgate-Palmolive Co. and instructor of the perfumery and essential oils course at Rutgers University will use as his subject, "Spice Oils of Interest to the Flavor Chemist."

S. B. Penick & Co. Move New York Offices

The general offices of S. B. Penick & Co. and its New York Quinine & Chemical Works Division have moved to 100 Church St., New York 8, N.Y. The move was made to modernize the company's facilities and to consolidate its operations. Telephone numbers both for Penick and NYQ remain the same. The teletype number for both Penick and NYQ will now be TWX NY 1-3461. A historical coincidence has been disclosed in connection with the new location. Penick's first offices in New York City, established in 1915 were located at 45 Barclay St. That building occupied part of the site on which 100 Church St. now stands.

Lady Esther Begins Program of Expansion

Lady Esther division of the Chemway Corp., Chicago, Ill. has begun an expansion program with increases in its sales staff and product development department. President Vincent P. Brunelli, has announced the appointment of Warren B. Dennis Jr. chief chemist to direct product development. Mr. Dennis who was formerly chairman of the New York Chapter of the Society of Cosmetic Chemists and has had much successful experience in the industry, has been conducting cosmetic rseearch for several new products which will be added to the Lady Esther line. Due to expanded merchandising plans John F. Ryan, John F. O'Connell and Allen Murdock have joined the sales staff.

BOISOLENE

An excellent base for modern perfumes. Imparts to compositions a warm, exotic woody note, and is remarkably lasting.

160 — 5th AVE., NEW YORK 10, N.Y.
CHELSEA 3-1937

Descollonges INC.

CHRISTMAS PARTY SPOTLIGHTS SPORTING LOOK

The Annual Christmas Party of Cosmetic Career Women, held at the Starlight Roof of the Waldorf-Astoria Hotel in New York, was attended by over 130 women and some 250 gifts were collected for needy children. Shown in the photograph, from the left: Eleanor Montville, assistant promotion manager, *Sports Illustrated*, speaker; Florence Chadwick, famous swimmer; Skeeter Werner, Olympic ski champion; Sarah Palfrey, tennis star; Ruth Kitchen, Dodge & Olcott, Inc., chairman of luncheon; Alice Ackerman, Avon Products, Inc., and Faye Fisher, Givaudan-Delawanna, Inc.

Cosmetic Career Women Asked To Exploit "Sporting Look"

Miss Eleanor Montville, assistant promotion manager of Sports Illustrated, advised the Cosmetic Career Women to take advantage of the promotional possibilities of today's "Sporting Look" in beauty. Miss Montville's address was made at the group's annual Christmas luncheon, held December 2 at the Waldorf-Astoria, New York City.

Tracing the development of the American "Sporting Look" as the national ideal in beauty today, Miss Montville illustrated her remarks with live models, sporting beauties representing three different age groups. She introduced Ski Champion Skeeter Werner, Swimming Champ Florence Chadwick, and Tennis Champ Sarah Palfrey.

Pointing to the need for creative merchandising, she suggested: promoting a cosmetic rehabilitation program as a positive, glamorous operation rather than pitching it as "medicinal", packaging a Winter Carnival kit aimed at the sports-enthusiastic teen-agers; making it easy and intriguing for the man to buy cosmetic gifts dedicated to his girl as a skier, golfer, fisherwoman.

Miss Montville emphasized the size of the new market begging for exploitation. "A few years ago," she said, "you could count but a few among the horse, dog and yachting sets." Today, she added, the statistics overwhelmingly point to the fact that the "Sporting Look" customer is almost everybody: As recently as 1954 there were 2½ million skiers. Today there are 5 million, and according to the National Ski Associates, most of the new devotees of the slopes are women; the girls are crowding the men off the golf courses—there are three million golfers; the Sport Fishing Institute reports that there are a half million women hunters and that every year five million fishing licenses are issued just to women, and Mom's part of the fleet of America's more than seven million recreational boats with their 35 million sailors.

Andre Wick Relinquishes Three Houbigant Presidencies

Andre Wick, associated for the past 38 years with the Houbigant organization in this country and abroad, has announced his decision to participate less actively from now on in day-to-day operations.

He has therefore relinquished his posts as president of the three American companies in this group, and assumed the chairmanship of the boards.

Succeeding him as presidents are: Jacques Manoha for Houbigant, Inc., and Cheramy, Inc., and Gerard Bungener for Houbigant Sales Corporation.

Mr. Bungener has been associated with the company for the past 12 years, in various phases of the business.

Pierre Harang, vice-president of the latter corporation, has been elected to similar posts in the other two companies. V. Vassilieff, Treasurer, has also become vice-president of the Houbigant Sales Corporation.

AMERICAN PERFUMER TOURS THE WORLD

An issue of American Perfumer holds the spotlight of world-wide readership in this photo taken in the Commercial Library in Zagreb, Yugoslavia.

British SCC Addressed by S. J. Bush

A stimulating lecture by S. J. Bush F.R.I.C. of County Laboratories Ltd., Stanmore, held at the Royal Society of Arts on 14th November on the subject of: "Chemical Analysis in the Cosmetic Industry" gave rise to the thought that many interesting lectures could well be given in this area of science on specific subjects. Mr. Bush covered a fairly wide field starting with the view that the analysis of unknown samples required some thought in the formulation of a suitable approach and could not be made by reference to a standard scheme or set of tables. Each analysis was a problem in itself and the history and/or intended use of the sample had to be carefully considered.

Semi-micro techniques saved time and material and a number of macro-procedures could be scaled down to deal with small samples. Chromatographic and colorimetric methods were frequently useful in such cases and a few typical determinations were outlined.

Two methods of determining ethylene oxide in condensates, both depending on decomposition with hydriodic acid, were described and have been found satisfactory in most cases. The determination of water by distillation with an immiscible solvent was found to be widely applicable to cosmetic products, but alcohol interferes. The interference of glycerol can be eliminated by using benzene as entrainer.

The accuracy of the results of an analysis depended upon the complexity of the mixture and the purpose for which the analysis was undertaken. The difficulty of making an accurate analysis in the presence of certain ingredients of ill-defined chemical composition was illustrated by a reference to the analysis of shampoos and the question of the presentation and interpretation of results was discussed.

In the discussion following the lecture Dr. A. W. Middleton asked the lecturer if he had measured the specific gravity of the water (plus any other liquids mixed with it) in the Dean and Stark estimations, the lecturer replied in the affirmative.

Dr. W. W. Myddleton made some comments of the use of calcium carbide in the estimation of water in products. The estimate was made by measuring the acetylene gas pressure produced in a closed system.

Referring to Dean and Stark Estimations Dr. Myddleton suggested that a D. and S. value should be quoted, a precise water content not being given.

A vote of thanks to Mr. Bush was moved by Mr. J. Pickthall, Past President of the Society and unanimously supported by the audience.

In a simple ceremony on the same occasion for the first time, the President of the Society, Dr. R. H. Marriott, presented the Society's Diploma Certificates to the candidates who had been successful at the recent examination.

Dr. Donald H. Powers Addresses New York Chapter of SCC

The January 7 meeting of the New York Chapter of the Society of Cosmetic Chemists heard an address entitled "Hope or Performance" by Dr. Donald H. Powers, director of Toiletries and Cosmetics Research, Warner-Lambert Research Institute. He spoke about the use of laboratory tests as the basis of accurate market testing of products. Dr. Powers, a former president of the SCC, is responsible for much original research and has directed numerous product developments in permanent waving and other hair preparations.

Dr. Arnold J. Lehman of the Food and Drug Administration has accepted the invitation to address the meeting of February 4. Dr. Lehman has been, since 1946, director of the Division of Pharmacology of the Food and Drug Administration. His topic will be "Drugs and Cosmetics—Should They Mix?" It is a timely one because of the present trend toward the use of phsiologically active materials in so-called "do-good" toiletries and cosmetics.

American Can Co. Absorbs Bradley, Sun Subsidiaries

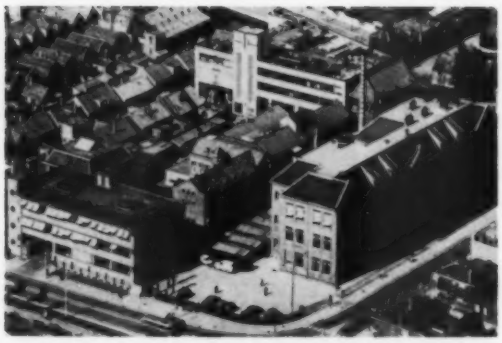
The American Can Co. has announced that the operations of its two former subsidiaries, Sun Tube Corp. and Bradley Container Corp. have been consolidated with the parent company.

Experimental data and practical manufacturing experience of nearly 100 years' specialization in beeswax and beeswax compounds are at your service without cost or obligation. Write about your beeswax problems to **WILL & BAUMER CANDLE CO., INC., Syracuse, N. Y. Est. 1885** *Dept. AP*

Spermaceti—Ceresine—Red Oil—Yellow Beeswax—Composition Waxes—Stearic Acid—Hydistear

look for the symbol of the RETORT
YOUR GUARANTEE
OF MATCHLESS QUALITY,
PURITY, UNIFORMITY
RITTER & Co
Behind the symbol of the Retort stands three generations of family pride and "know-how" in Essential Aromatics, natural and synthetic flavors, perfumer's specialties. Made in the West's most modern plant. The Retort is your guide to dependability.
F. Ritter & Co.
Los Angeles 39, California
Branch Offices in Principal Cities

The Union Beach, New Jersey, Plant of van Ameringen-Haebler



The Zaandam, Holland, plant of Polak & Schwarz

Merger of Polak & Schwarz and van Ameringen-Haebler

Announcement was made recently by A. L. van Ameringen, chairman of the fifty-year-old firm, van Ameringen-Haebler, Inc., of New York, and C. C. Brummer, managing director of the seventy-year-old Polak & Schwarz N. V. of Zaandam, Holland, that the two companies merged their operations as of December 31, 1958.

A parent company to be known as International Flavors & Fragrances Inc., with headquarters in New York, provides an organization of first-rank size and broad international scope. Through its wholly-owned manufacturing subsidiaries in fifteen countries, International Flavors & Fragrances will supply, on a world-wide basis, fragrance materials for use in products such as perfumes, soaps, cosmetics, and aerosols, and flavors for chocolate, candy, drug, food, beverage, and other industries. The van Ameringen-Haebler and Polak & Schwarz organizations will retain their identities as divisions of the parent company. Each will continue to serve its customers as in the past, but on a greatly expanded basis.

The combining of the facilities of these firms will be of special importance to those companies, both U. S. and foreign based, that manufacture and sell abroad through overseas branches and subsidiaries since the problems of importing materials are becoming more complicated by tariffs, currency restrictions, and import licenses. Now the overseas producer will be able to obtain materials manufactured locally in such key areas as England, Canada, Holland, Switzerland, France, South Africa, Indonesia, Brazil, and Argentina.

Van Ameringen-Haebler has recently completed a 1.5 million dollar expansion of its manufacturing and research operations at Union Beach, New Jersey. Through the use of modern techniques and highly-instrumented equipment of their own design they are producing annualy more than 2.5 million pounds of perfume materials to meet the growing need for finer fragrances in many kinds of products.

A. L. van Ameringen, board chairman of International Flavors & Fragrances Inc.

C. C. Brummer, executive vice president of International Flavors & Fragrances Inc.

Polak & Schwarz brings to International Flavors & Fragrances a world-wide manufacturing and distributing organization which has expanded steadily since 1889. At the start their activities were confined to Holland but they later opened plants in Belgium and France, and in 1926 another in England. Today they operate manufacturing units in fifteen countries, and in addition they have more than 100 agents throughout the world.

In commenting on the merger, Mr. van Ameringen said, "Although both companies are creators and producers of synthetic as well as natural fragrances and flavors, their activities in the past have been largely complementary rather than competitive in terms of products, processes, research, and the geographical location of plant facilities. Both companies have established reputations for pioneering work in chemical research and for utilizing modern production techniques. Van Ameringen-Haebler has devoted a higher percentage of its efforts to aromatics and fragrances; Polak & Schwarz, on the other hand, has concentrated much of its efforts on aromatics and flavors. We look forward to a combined creative, research, and production organization better able to serve customers wherever they may be located."

Principal officers of International Flavors & Fragrances Inc. are: A. L. van Ameringen, Board Chairman; Charles P. Walker, President; C. C. Brummer, Executive Vice President; Adolph Schwarz and Waldo F. Reis, Vice Presidents. Mr. van Ameringen, Mr. Walker, and Mr. Reis previously held these same positions with van Ameringen-Haebler, and Mr. Brummer and Mr. Schwarz served as Managing Directors of Polak & Schwarz.

Younger Women Try More, Buy More, According to Redbook Beauty Survey

It is not an altogether startling revelation that women of the younger age group, 18 to 34 in this case, buy a greater quantity and variety of beauty products since this just about covers the mating age and sadly, with but few exceptions, the age of physical beauty. Since Royal Jelly has not yet been found to lure esthetic or cultural beauty through the tired old pores and no placenta extract found to erase the wrinkles and inject the beauty of personality, this physical beauty is all we can measure, in terms of the endless, desperate search for it and by the numbers of windmill-jousting dollars sacrificed to it. The degree of desperation of the younger group and resignation of the older group (50 and over) become but a by-road in the shadow of black percentage columns of who, what, and why.

When asked what they would consider the six daily beauty and personal care items they "simply couldn't do without," Lipstick (77.1% of the total number replying) led the list with Deodorant, Soap and Water, Face Creams, Loose Face Powder, Powder base, Face Lotions, Toothpaste or toothpowder, Hand lotion, Fragrances, Rouge, Eyebrow pencil, Shampoo, Hand Cream, Bath Preparations, Brush and/or comb, Mascara, and Hair spray/lacquer/dressings following in that order by percentages. Only 21.4% listed toothpaste or toothpowder among the six items. 18% of the women in all groups considered Fragrances important enough to place among the necessities. Quite naturally, it was Face creams that scored the highest percentage (69.6% had it on the list) among the age group of 50 and over. When asked if they had tried any new or improved beauty care products in the past 12 months, 75.2% of the younger age group answered Yes, along with 70.3% of the 35-49 age group and 57% of the 50 and over age group. Again it appears to be the face they are dissatisfied with. Face lotions and Face creams top the list of new products tried. Asked if they would continue to use the new product they have tried, the overall group gave the nod to Face creams (85.9% said they would continue), Hand cream (85%) and Powder base (83.3%) with Home permanents getting the largest percentage of negative votes (37.2% would not continue). Of a base number of 4,666 Redbook readers asked if they use Nail Polish or Enamel, 26% of the total group said No. It is interesting to note that 4.9% of the base group tried press-ons and that almost three-fourths of these said they would not continue to use the product. In the deodorant line, creams are used by a greater proportion of the women, while most men prefer sprays. However, over half of the women have changed their deodorant type in the past year with creams suffering the heaviest losses and roll ons the highest gains.

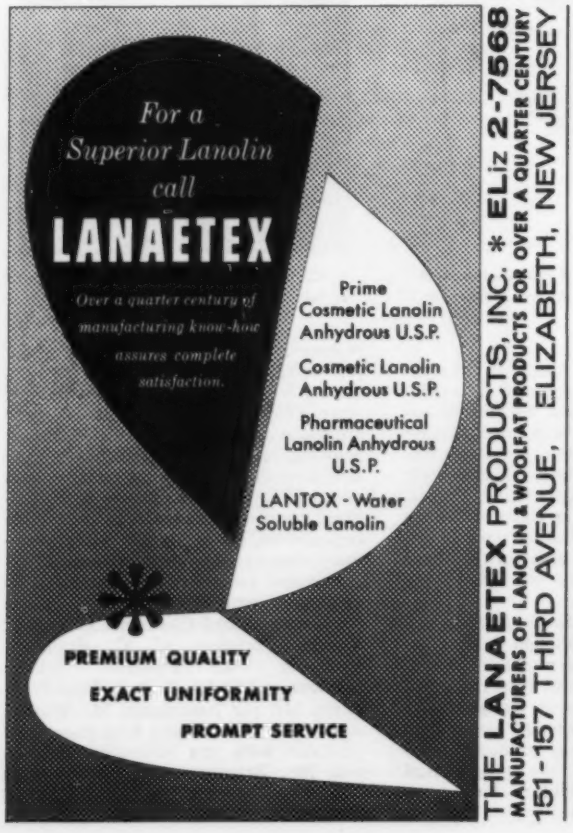
Two Board of Trade Officers Get New Titles

The two top officers of the Drug, Chemical and Allied Trades Section of the New York Board of Trade, Ralph A. Clark and William W. Huisking will henceforth be designated president and vice president respectively instead of chairman and vice chairman. These new titles were conferred by vote of the DCAT Executive Committee at its meeting on December 18, under authority of a recent amendment to the by-laws of the New York Board of Trade.

SEMI-ANNUAL EDITORIAL INDEX NOW AVAILABLE

The semi-annual editorial index of AMERICAN PERMUER AND AROMATICS for the period from July 1 through December, 1958 is now available. Copies can be obtained without charge by writing to:

AMERICAN PERFUMER AND AROMATICS
48 West 38th Street
New York 18, N. Y.


For a Superior Lanolin call
LANAETEX
Over a quarter century of manufacturing know-how assures complete satisfaction.
Prime Cosmetic Lanolin Anhydrous U.S.P.
Cosmetic Lanolin Anhydrous U.S.P.
Pharmaceutical Lanolin Anhydrous U.S.P.
LANTOX - Water Soluble Lanolin
PREMIUM QUALITY
EXACT UNIFORMITY
PROMPT SERVICE

THE LANAETEX PRODUCTS, INC. * ELiz 2-7568
MANUFACTURERS OF LANOLIN & WOOLFAT PRODUCTS FOR OVER A QUARTER CENTURY
151-157 THIRD AVENUE, ELIZABETH, NEW JERSEY

Successor to W. J. Bush & Co., Inc.

R. D. WEBB & CO., INC.

Distillers of essential oils of outstanding quality.
Exclusive American agents for genuine

MYSORE SANDALWOOD OIL

R. D. WEBB & CO., INC.
Main Office: Cos Cob, Conn. Branches: Chicago and Los Angeles

NOW OVER 5100 BIOS CHEMICALS
Including
ALL NEW & RARE
SYNTHETIC & NATURAL
RAW MATERIALS
For Perfumes & Flavors
Ask for our new complete catalogue
BIOS Laboratories, Inc.
17 West 60th St. New York 23, N. Y. PLaza 7-8171

SPOTLIGHT News...

Patent rights in the United States, for a new process for manufacturing vanillin are offered by the Norgwegian firm A/s Norsk Fraktaroma. The process is reported to be a new method of manufacturing vanillin from sulfite waste liquor. Norsk, which manufactures artificial flavors, will consider the outright sale of the patent which is registered in the U. S. under No. 2,752,394. Any interested firm may write to the Drug, Chemical and Allied Trades Section of the New York Broad of Trade for more information.

For long and devoted service to the American people Commissioner George P. Larrick of the Food & Drug Administration received the annual award of the Pharmaceutical Manufacturers Assn. at its annual meeting in New York December 9.

Diversification of its products and the strength of the organization were responsible for the past record year in sales and earnings of the Procter & Gamble Co. according to R. R. Deupree chairman of the board in a report to stockholders at the annual meeting.

Planning your marketing operations for 1959 and the years ahead is the subject of a booklet issued by the A. C. Nielsen Co., 2101 Howard St., Chicago, 45, Ill. which is available without charge from the company. The material in the booklet, based on a talk by Nielsen president J. O. Peckham, covers U. S. grocery store sales. Among the subjects covered are the private brand and the competitive brand situations.

Alkyds in Transition will be the subject of a special panel symposium sponsored by the Glycerine Producers' Assn. at the Waldorf Astoria hotel, New York, January 22.

All hair accessories needed by a woman to care for and style her hair at home will be provided by the Toni Co., Chicago, 54, Ill. The new line which will be introduced in February includes hair brushes, combs, nets, bobby pins, barrettes, head bands and an assortment of curlers. Other products made by the company for home hair care are home permanents, shampoos, cream rinses, curlers and a hair spray. In addition it also markets a lotion-cream deodorant and a facial cleansing lotion.

An advertising budget of $2,080,000 for 1959 has been approved by the Bon Ami Co., New York City. Bon Ami's new cleanser containing a monopersulfate compound, will absorb 70% of the appropriation. Five other products of the company will utilize the remainder.

An affiliate in Sao Paulo, Brazil Essencias Fleuroma Limitada under the direction of Fred L. Van Aalst has been established by Fleuroma, Inc., New York City, Leo Schulmann, of the Fleuroma technical staff for ten years has been appointed general manager of the Brazil affiliate. The company is also enlarging its European facilities and has appointed Eric W. Zielenziger as foreign operations manager. He is a specialist in international marketing and finance and in the essential oil business.

The Aerosol division of the Chemical Specialties Manufacturers Assn. celebrated its tenth anniversary as a division of the association with a display of over 10,000 aerosol products assembled in supermarket style during the 45th annual meeting of the association in New York. Members of the publicity committee acted as "sales clerks" helping guests to select items.

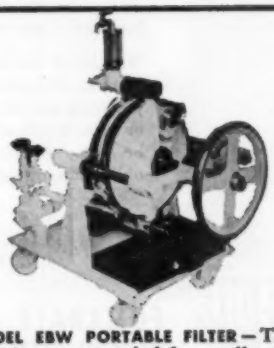
The Prince Matchabelli plant in Bloomfield, N. J. will be closed during the coming Summer according to an announcement from the parent company Chesebrough-Ponds Inc.

Juliette Marglen, a division of Faberge Inc. New York City, has launched a Nail Glace Kit of six tri-cornered bottles of the new product which also contains a tube of gelatin glace remover in a gold and gray gift box which retails for $3.75.

A new pricing chart issued by the Better Business Bureau has been published to aid stores and others in keeping their comparative price and value claims honest. It contains a digest of the recently issued Federal Trade Commission "Guides Against Deceptive Pricing," with interpretations recommended by the Association of Better Business Bureaus. The chart is designed especially for all directly concerned with keeping comparative price and value claims in line with F. T. C. guides. The chart 8¼ x 15 in. is printed on heavy stock and a copy may be had without charge from local Better Business Bureaus or from the Bureau in the Chrysler building, New York 17, N. Y. A self addressed stamped envelope is requested.

A merger of Alpha Aromatics Inc. and Trufruit Syrup Corp. both of Brooklyn, N. Y. has been announced by Joseph Surry president and Milton Ainbinder, treasurer, of Alpha Aromatics Inc. Trufruit will retain its identity and will be operated as a division of Alpha Aromatics Inc. Alpha will move to the plant and offices occupied by Trufruit at 650 Sixty-second St., Brooklyn, N. Y.

FILTERS AND BOTTLE FILLERS
for the Perfumer



MODEL EBW PORTABLE FILTER — This filter is recommended for small capacity requirements. Accomodates from 4 to 8 12¾" dia. filter disks. Easy to set-up and operate.

PORTABLE VACUUM BOTTLE FILLER

Will rapidly fill small or batch lots of material at lowest cost. Fills bottles to uniform height without loss of material. Interchangeable spouts for filling shaker-type bottles to gallons.

ASBESTOS FILTER SHEETS
Various Sizes

Ertel Asbestos Filter Sheets for ultra polished brilliance are used for many fine perfumes and cosmetics. Available in 10 grades to fit all standard filters. Write regarding samples for superior result tests in your filter.

Write for Illustrated Catalog

ERTEL ENGINEERING CORP.
10 FAIR ST., KINGSTON, N. Y.
Branch Office & Showroom
New York City

If it's Foil...

discuss your needs with us. Printing, embossing and die-cutting in foil is our business — *our only business.*

Whether it is a foil seal, label, wrap, or merchandise card, we will work with you from design to finished job. Phone or write for ideas and estimates. We will be happy to consult with you, without obligation, of course.

FOILCRAFT PRINTING CORPORATION
Dept. C • 3611 14th Ave., Brooklyn 18, N. Y., GEdney 6-4516
Roselawn Center Bldg., Cincinnati 37, O., Melrose 1-8963

CITRUS OILS

Products of Our Dominican Republic and Cuban Plantations

OIL OF LIMES
OIL OF BITTER ORANGE
OIL OF SWEET ORANGE

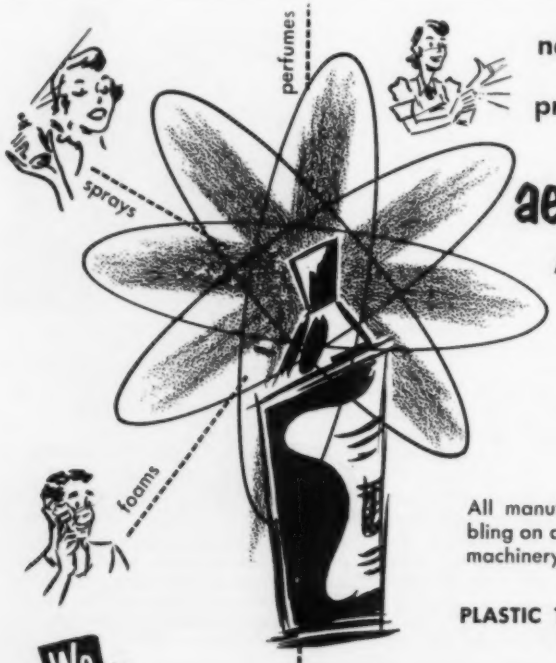
Manufacturers of the Finest Terpeneless and Concentrated Citrus Oils

OIL OF BERGAMOT

Official stock distributor since 1936 for
CONSORZIO DEL BERGAMOTTO
REGGIO CALABRIA, ITALY

Serving the Perfume, Flavor, and Pharmaceutical Industries for over 35 Years

Citrus & Allied Essential Oils Co.
61-63 SHEFFIELD AVE. • BROOKLYN 7, N. Y.



new IDEAS and new products...our STRENGTH

aerosol packaging

AND NITROGEN FILLING

SPRAYS . . . FOAMS . . .
METERED PURSE-SIZE AEROSOLS

- PRODUCT FORMULATION
- PACKAGE CREATION
- QUALITY CONTROL

All manufacturing, packaging, and assembling on continuous-flow production lines . . . machinery and connections of stainless steel.

PLASTIC TUBES & CONTAINERS FILLED NITROGEN FILLING

We . . .
FORMULATE
MANUFACTURE
PACKAGE

Old Empire

HUmboldt 4-2121
N.Y.C. WOrth 4-7870
865 Mt. Prospect Avenue, Newark 4, New Jersey

Old Empire

PERFUMES & COLOGNES
LIQUID & CREAM SHAMPOO
TOOTHPASTE
HAIR PREPARATIONS & SPRAYS
DEODORANTS
SHAVING CREAMS
SKIN PREPARATIONS
CREAM RINSE
HAND PREPARATIONS
BATH PREPARATIONS
OINTMENTS
PHARMACEUTICALS

PERSONALITIES

Marvin Steinbock has been appointed director of production at Aerosol Techniques, Inc. The appointment was announced recenlty by H. R. Shepherd, president of the aerosol packaging and development company. Mr. Steinbock will be in charge of all processing at ATI's lately-expanded main plant in Bridgeport, Conn., and will work closely with the new laboratory installations. The new production manager was formerly at PowrPak-ConnChem as vice-president in charge of manufacturing and previously with Connecticut Chemical Research Corp. in a similar capacity. For more than six years he was chief of production engineering for Revlon.

Marvin Steinbock

Jacques d'Aigremont, president of Roure-Dupont, Inc. and Floramatic, Inc., its affiliate, devoted to export in South America, has just returned from a month's trip to Central and South America where he had the opportunity of conferring with his agents and principal customers. He found these markets being more avidly solicited by producers all over the world, which makes for the keenest competition ever. Despite these factors, he found an expanding market for his companies' products.

Harry D. McNeeley, vice president of Tennessee Eastman Co., has been named Executive Vice President according to a recent announcement.

Thomas J. Casey has been named general sales manager of Mojonnier Associates, manufacturers and distributors of aerosol filling machines.

John N. Carroll has been named vice president in charge of sales of the George W. Luft Co., Inc., Long Island City, N. Y., manufacturers of Tangee cosmetics, according to an announcement by Constance Luft Huhn, president.

Kenneth G. Voorhees, Jr. has joined the staff of Ungerer & Co. Inc., after having served with the Armed Forces, according to a recent announcement by Kenneth G. Voorhees, president of the company. Garry continues the family lineage being a great-grandson of W. P. Ungerer who founded Ungerer & Co. in 1893, a grandson of F. H. Ungerer, and the son of the President, Kenneth G. Voorhees. Prior to serving in the Armed Forces, Garry spent considerable time in several manufacturing departments at Ungerer's Totowa plant.

Kenneth G. Voorhees, Jr.

Gene Billingsly

Gene Billingsly has been appointed sales promotion manager for The Toni Co. Employed by Toni since 1953, Mr. Billingsley joined the company as a salesman, and has since served as sales supervisor and assistant sales promotion manager. Before joining Toni, Mr. Billingsley was with the Crowell Collier Publishing Co.

James E. Spencer of the Harshaw Chemical Co. has been elected president of the Salesmen's Assn. of the American Chemical Industry, Inc., for 1959.

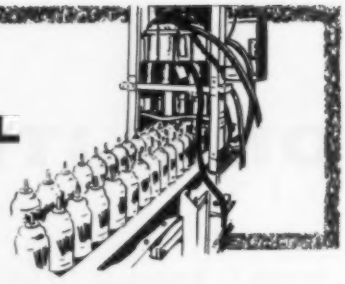
Daniel B. McAfee has been named vice president in charge of sales, and **Robert Mahan,** vice president in charge of operations at A. H. Wirz, Inc., pioneer tube manufacturers. Announcement of these two new appointments to its executive staff was made by Robert F. Cox, president on the 123-year old Chester firm. Prior to joining Wirz, Mr. McAfee was New England district manager for American Cyanamid's Plastics and Resins Division in Boston, and before that, assistant sales manager of Sheffield Farms Dairy in New York. In his new capacity with Wirz, he will be responsible for national sales of the company's rapidly expanding line of metal and plastic tubes and specialties.

Daniel B. McAfee

Robert Mahan

Mr. Mahan has been associated with Wirz in many capacities since his graduation from the University of Pennsylvania in 1939. Most recently he was vice president and general manager of Wirz's Carrollton, Ky. plant and prior to that, headed up its quality control department at Chester. Thus Mr. Mahan returns to headquarters with new and greater responsibilities including overall direction of the company's production and labor relations operations.

Guide to
AEROSOL
PACKERS



EAST

Thomasson
OF PA., INC.
AEROSOL FILLING
for Contract and Private Label Marketers
Also Liquid Filling
Complete Research and Laboratory Facilities
Constant Quality Control
Norristown, Pa. BRoadway 5-4355

MID-WEST

Symbol of Experience in Aerosol Development & Packaging
for Aerosol "Know-How" Call
CONTINENTAL FILLING CORPORATION
123 N. Hazel • Danville, Illinois

IMAGINATION • CREATION • REALIZATION
ATi
AEROSOL TECHNIQUES
INCORPORATED
Exclusively private label manufacturer of aerosol cosmetics, pharmaceuticals and chemical specialties.
Bridgeport 5, Conn. EDison 6-0176

MOVING?
If you're a subscriber to American Perfumer, and you are moving, please let us know. Include your NEW and OLD address, and allow six weeks for the change. Address all subscription mail to:
AMERICAN PERFUMER & AROMATICS
CIRCULATION DEPARTMENT
48 West 38th St. • New York 18

If you haven't got a personal copy of
"COSMETIC EMULSIONS 1958" . . .
. . . here's your chance to get a COMPLETE reprint of the feature.
Each article is reproduced in full . . . with all of the details on research, procedures, formulae, and equipment—exactly as it appears in the June "Perfumer." *Payment must accompany order.*
To get your copy, send 50¢ to
Moore Publishing Company, Inc., 48 West 38th Street, New York 18, N.Y.
Quantity prices are also available.

Trade Literature

The Kessler Chemical Co., Inc. of Philadelphia, Pa., has issued a new catalog, headed "Esters for use in Cosmetics and Pharmaceuticals." It contains practical application data, together with a large number of tested formulations. Several generic classes of surfactant materials are listed, including the laurate, oleate and stearate esters of Polyethylene Glycols, Glycerol, Ethylene Glycol, Propylene Glycol and Diethylene Glycol. A copy of this 76 page catalog may be had by writing Kessler Chemical Co., Inc., State Road & Cottman Ave., Philadelphia 35, Pa.

A new, full-color, four-page brochure describing its extensive line of printed, rigid plastic containers for packaging, has been published by Lermer Plastics, Inc. The folder describes and illustrates the virtually unlimited printing designs and colors possible with Lermer's wide variety of lightweight, shatterproof plastic containers. Unprinted containers are also available.

Drum covers to prevent dusting and contamination during automatic weighing of chemicals, powders and other materials are described in a new Product Data Sheet offered by Richardson Scale Co., Clifton, N. J. The data sheet explains how the new drum covers operate in conjunction with Richardson automatic scales to provide uniform filling of containers of various sizes. Operating instructions are given to illustrate how the drum cover unit descends to seal off the top of the container to prevent escape of fumes and dust. Optional arrangements for increased capacity are also listed.

A revision of the brochure on LaPine-Leybold line of atom models according to Stuart and Briegleb brings information on uses up to date. Coverage is expanded to include illustrations that show how models are assembled and disassembled. Ask for Bulletin 10a58. A separate, six-page brochure (1a58) on ten additional atom models used to construct metal chelate molecular models is also available upon request from Arthur S. LaPine and Co.

MARKET REPORT

Substantial Declines Noted

The price outlook for the first quarter of the new year is regarded as highly clouded particularly with respect to oils citronella, bois de rose, lemongrass, clove leaf and the extended line of chemicals that are made from these articles. Floridian orange oil has been steadily losing ground over the past two months. Unless another freeze should hit the citrus area such as the periods of low temperatures that occurred a year ago, further declines in orange appear probable.

TRENDS IN DETAIL

Advances	Current	Previous
Glycerin, crude		
Soap lye	$ 0.18	$ 0.17
Saponification	0.19½	0.18½
Oil geranium, Algerian	17.00	16.50
Oil spearmint	6.35	6.25
Oil vetiver, Haitian	11.50	10.75
Red oil, tanks	0.14¾	0.14½
Stearic acid, single pressed	0.16¼	0.16
Declines		
Balsam, Tolu	$ 2.65	$ 2.75
Gum styrax, Asiatic	4.25	4.75
Cyclamate, sodium, calcium, drms	1.95	2.50
Oil Orange, lb.		
West Indian, bitter	3.40	3.85
Floridian	1.20	1.50
Eugenol	1.75	1.85
Hydroxycitronellal	4.25	4.50
Coconut oil, coast, tanks	0.17	0.19¼
Copra, coast, ton	230.00	248.00
Tallow, fancy	0.07⅞	0.08⅜
Grease, white	0.08	0.08⅝
Caffeine	2.10	2.50

Prices per pound unless otherwise specified

CITRONELLA OIL SOFT—

The brief ban on exports of citronella oil off of Formosa last month failed to bring about any strengthening in the overall position of the market. In resuming exportations, Formosa increased its quota for the new year by 500,000 pounds to 4,500,000. Reports from the producing area stated unless the decline in the price trend is checked, producers will become discouraged and there will be a drop in output. China's unknown quantity of oil going into the European market could tend to have a further depressing influence on prices.

TARTRATE POSITION CHANGING—

A drastic change in tartrates looms in the months ahead in the face of increasing imports of tartartic acid from Spain and Italy and a curtailed output of domestic acid. The shift in output will likewise bring a corresponding drop in the flow of crude material, argols, from the major wine producing countries of the world, including France, Algeria, and Italy. While tartaric acid of domestic origin is likely to be available for several months, production was suspended a month or two ago as the result of severe competition from low priced acid from abroad.

MINT OILS STEADY—

An undercurrent of strength continues to prevail in spearmint. Peppermint has been holding relatively steady over the past several weeks. Some trade observers, basing their predictions on the amount of oil that will be available in the months ahead expect the market to develop renewed weakness. There were good quantities of peppermint oil available from last years crop it is recalled but the tight supply position in high test oil served to strengthen the overall position of the market.

FATTY ALCOHOLS RISE—

Because of sharp advances in world prices of the raw material coconut oil, all grades of lorol fatty alcohols were boosted by approximately 11 percent at the start of the new year. The alcohols are widely used chemical intermediates made by the hydrogenation of coconut oil. New prices for less carlot quantities are 43½ cents in less carload quantities of 2,000 pound minimum, and 44½ cents for less than 2,000 pound quantities. Previous price for less carlot quantities was 37 cents for less carload lots, including a minimum of 2,000 pounds and less than 2,000 pounds.

FATTY ACIDS HIGHER—

Because of recent increases in production costs, red oil and stearic acid prices scored fractional advances. Stocks are not regarded as heavy. Demand over the past month while somewhat below the movement in November proved sufficient to lend a degree of support to the higher levels.

CITRATES ACTIVE—

The reduction in prices announced by British makers failed to have any effect on the domestic market. Deliveries of sodium citrate and citric acid were running into a good volume against outstanding orders.

STYRAX EASES—

Fresh receipts including one direct shipment from Turkey and another from Germany served to ease the spot supply position in Asiatic styrax gum. Prices, while lower, at $4.25 to $4.35 per pound are still regarded as high and continued buyer resistance may bring a further drop in prices. The Honduran variety likewise declined from $5 to $4.50 a pound. The Honduran styrax which is said to be entirely different in character normally sells at considerably below the Asiatic styrax.

CYCLAMATES OFF SHARPLY—

Non-caloric sweeteners, calcium and sodium cyclamates have been reduced sharply in an effort on the part of producers to develop new outlets for the chemicals. The reduction amounting to 55¢ per pound established the new price for 100-pound drum lots at $1.95. Prices for 25 and 5 pound containers were reduced to $2.45 and $2.70 per pound, respectively.

GLYCERIN FIRM—

Arrivals of foreign crude glycerin have fallen off and the market for domestic crude developed a decidedly stronger tone. Some lots of domestic saponification were sold in the mid-West at 21 cents per pound but as a general rule buyers did not appear willing to pay more than 19½ cents a pound.

MENTHOL STEADY—

Japanese menthol turned firmer for shipment and an increasing number of orders for the account of smaller consumers served to have a steadier influence on the natural product from Brazil. Prices on the latter article were maintained at $5 to $5.50 per pound, according to grade.

TL Beeswax

- PURE WHITE
- EXTRA QUALITY
- ABSOLUTELY PURE
- ABOVE U.S.P. STANDARDS

• Samples will gladly be sent on request—at no obligation

Serving the Trade for 107 Years

THEODOR LEONHARD WAX CO., INC.

HALEDON, PATERSON NEW JERSEY

Western Distributor: A. C. Drury & Co., 219 E. North Water St., Chicago, Ill.

1905 — 1959

FIFTH AVENUE PROTECTIVE ASSOCIATION

A NATIONALLY USED COLLECTION AGENCY
covering the U. S. through its own personal representatives

142 Lexington Avenue New York 16, N. Y.
(Our Own Building)

WE BUY FOR CASH

CLOSE-OUTS • SURPLUS

Bottles • Caps • Jars • Containers • Chemicals • Closures
Cosmetics of any Descriptions

Also Business Small or Large . . .

UNIVERSAL OUTLET CO.
1 E. 15th St. • New York 3, N.Y.
Telephone Oregon 5-9444—
Oregon 5-8568

Aromatic Chemicals
FOR PERFUMERY AND FLAVORS

Iso Propyl Quinoline • Isobutyl Quinoline
Ethyl Anthranilate • Butyl Anthranilate
Linalyl Anthranilate • Linalyl Isobutyrate

FAIRMOUNT CHEMICAL CO., INC.
600 Ferry Street Newark 5, N. J.

MOULDS for LIPSTICKS MASCARA SUPPOSITORIES STYPTIC PENCILS and DIES for ROUGE COMPACT POWDER

Write for Catalog

A. CAVALLA, INC. 163 West 18th Street, New York, 11, N.Y.

CAMEO
DIE AND LABEL COMPANY
Creators of fine Labels, Tags and Packages
154 WEST 14th STREET, NEW YORK 11, N.Y.
ORegon 5-0228

What you need to know about COMMERCIAL SURFACTANTS

Here is the most up to date information on commercial surfactants available today, reprinted from The American Perfumer and Aromatics. Beginning with the structure and properties of surfactants . . . through cationics in cosmetics . . . and nonionic surfactants . . . it offers a wealth of working data. The number of copies is limited. Please order now.

Moore Publishing Co., Book Division PF-1
48 West 38 Street, New York 18, N. Y.

We enclose payment for———copies of COMMERCIAL SURFACTANTS at 50¢ a copy.

NAME .....

COMPANY .....

STREET .....

CITY ..... ZONE ..... STATE .....

CLASSIFIED ADVERTISEMENTS

Rates per line, per insertion: Situations Wanted and Help Wanted, 50c. All other classifications, $1.00. Please send check with copy.

BUSINESS OPPORTUNITIES

EXECUTIVE, WELL KNOWN COSMETIC CHEMIST WITH Product Development, Customer Service and Sales Experience seeks participation in a going business. Reply to Box 3184, AMERICAN PERFUMER & AROMATICS, 48 W. 38 St., New York 18, N. Y.

HELP WANTED

CHIEF CONTROL CHEMIST

Responsible position available with new plant of a large corporation located in South Jersey.

Successful applicant must have at least a BS degree in chemistry or allied field and be over 29 years of age. He must have proven his ability to supervise the control function in the pharmaceutical or cosmetic industry.

Reply fully stating age, education, experience and salary required to: Box 3183, American Perfumer & Aromatics, 48 W. 38 St., New York 18, N.Y.

RAPIDLY GROWING PHARMACEUTICAL MANUFACTURER IN SOUTHWEST has opening for man to head PRODUCT DEVELOPMENT LABORATORY. Must have experience in formulation and production of cosmetics and pharmaceuticals intended for external use. Excellent opportunity for advancement. Box 3179, AMERICAN PERFUMER & AROMATICS, 48 W. 38 St., New York 18, N.Y.

Noville Essential Oil Company, Inc.

SALESMAN FOR METROPOLITAN AND NEARBY AREAS. A real opportunity for man familiar with the selling of quality compounds and basic raw materials, to grow with a growing concern. 1312-Fifth Street, North Bergen, NJ. UN 7-9080.

SITUATION WANTED

CHEMIST—Strong background in cosmetic development, production and quality control; degree in Chemistry with additional training in Chemical and Industrial Engineering; seeking position with organization that appreciates ability, integrity and initiative. Box 3185, AMERICAN PERFUMER & AROMATICS, 48 W. 38th Street, New York 18, N.Y.

Use

American Perfumer

Classified for

Best Results

PROFESSIONAL SERVICE

"L'ART de la PARFUMERIE par EXCELLENCE"
And Its Application to the Industry

DR. JEAN JACQUES MARTINAT

PERFUMER-CHEMIST CONSULTANT

Perfumes
Cosmetics
Toilet Articles
Soaps
Flavors

Creations of Highly Original Perfumes
Duplications of Most Difficult Fragrances
Unique Kind of Professional Services.

Kindly Inquire

333 WEST 52ND STREET, NEW YORK 19, N. Y.
TEL. PLAZA 7-3861

RESEARCH AND DEVELOPMENT
Cosmetic Formulation and Improvement

Toxicology, skin-irritation studies, analyses and formulations, soap and syndet evaluations. Free booklet: "How to Develop Successful New Cosmetics."

SNELL

FOSTER D. SNELL, INC.
29 West 15th St., New York 11, N. Y.
WAtkins 4-8800

LEBERCO LABORATORIES
Irritation Studies—Sensitivity Tests
Toxicity and Safety Tests on
Shampoos—Cold Wave Lotions—All Cosmetics
Pharmaceutical and Cosmetic Research
Hormone Assays—Bacteriological Studies
127 HAWTHORNE ST., ROSELLE PARK, N. J.

Miniature Perfume Bottles from ⅛ dram to ½ oz.

Handmade Glass Novelties • Miniature Glass Funnels
SPECIAL ORDER WORK
KENBURY GLASS WORKS
132 W. 14th Street New York 11, N. Y.

Carl N. Andersen, PhD
Consulting Chemist
Cosmetics, Soaps and Synthetic Detergents
OFFICE AND LABORATORY
150 South Highland Avenue, Ossining, N.Y.
Phones: Wilson 1-1550; Wilson 1-7959

Index OF ADVERTISERS

Abbe Engineering Co. ..... —
Aerosol Techniques, Inc. 62
Alpine Aromatics, Inc. ..... —
American Aromatics, Inc. 6
American Cholesterol Products, Inc. —
American Lanolin Corp. ..... —
Andersen, Carl N. 65
Ansbacher-Siegle Corp. ..... —
Antara Chemicals, A Sales Division of General Aniline & Film Corporation ..... —
Archer-Daniels-Midland Chemical Products, Inc. ..... —
Aromatic Products, Inc. ..... —
Atlas Powder Company ..... —
Avon Products ..... —

Bertrand Freres 2
Bios Laboratories, Inc. 58
Boake, Roberts & Co., Ltd., A. 27
Bopf-Whittam Corp. ..... —
Builders Sheet Metal Works ..... —

Cameo Die & Label Co. 64
Camilli, Albert & LaLoue, Inc. 66
Carr-Lowrey Glass Co. 1
Cavalla, Inc., A. 64
Charabot & Co., Inc. ..... —
Chauvet & Co., Pierre ..... —
Chemo Puro Mfg., Corp. 38
Chiris Co., Antoine ..... —
Citrus & Allied Essential Oils Co. .. 60
Classified Advertisements 65
Continental Can Company, Hazel Atlas Glass Division ..... —
Continental Filling Corp. 62
Croda, Inc. ..... —

Descollonges, Inc. 54
Deutsche Hydrierwerke, G.m.b.H. .. —
Distillation Products, Industries, Div. of Eastman Kodak ..... —
Dodge & Olcott, Inc. 34
Dragoco, Inc. 43

Emulsol Chemical Corporation ..... —
Ertel Engineering Corp. 59
Esperis, s.a. ..... —
Esrolko, Ltd. ..... —

Fairmount Chemical Co., Inc. 64
Felton Chemical Co., Inc. ..... —
Fifth Avenue Protective Assoc. 64
Firmenich & Co. ..... Insert 49
Fisher Chemical Co., Inc. ..... —
Foilcraft Printing Corporation 60
Fritzsche Brothers, Inc. ..... —

General Chemical Div., Allied Chemical Corp. ..... —
Gifford-Wood Co. ..... —
Givaudan-Delawanna, Inc. 8
Goldschmidt Chemical Corp. 24
Greeff & Co., Inc., R. W. 30

Halby Products ..... —
Hazel Atlas Glass Division, Continental Can Company ..... —
Heine & Company ..... —
Heyden-Newport Chemical Corp. ... —
Hoffman LaRoche, Inc. ..... —

International Flavors & Fragrances, Inc. 14
Ising Corporation, C. E. ..... —

Katz & Co., Dr. Alexander, Div. of F. Ritter & Co. 56
Kenbury Glass Works 65
Kessler Chemical Co., Inc. 28
Knapp Products, Inc. 12
Kohnstamm & Company, Inc. ..... —

Lanaetex Products, Inc., The 58
Lanitis Bros., Ltd. ..... —
Lautier Fils, Inc. ..... —
Leberco Laboratories 65
Leeben Color & Chemical Co. ..... —
Leonhard Wax Co., T. 64
Lueders & Co., George ..... —

Martinat, Jean Jacques, Dr. 65
Maryland Glass Corp. 13
Mauer-Wirtz 12

Old Empire, Inc. 60
Owens-Illinois Glass Co. ..... —

Parento, Inc., Compagnie 18
Parsons-Plymouth, M. W. ..... —
Peerless Tube Company ..... —
Penick & Co., S. B. 29
Polak's Frutal Works 7
Polak & Schwarz International N. V. 14
Polarome Manufacturing Company, Inc. ..... —

Reheis Co., Inc. 39
Revlon Inc. ..... —
Rhodia, Inc. ..... —
Richford Corp. 52
Risdon Manufacturing Co., The Back Cover
Ritter & Co., F. 56
Rona Laboratories, Inc. ..... —
Roure-Dupont, Inc. ..... —

Schimmel & Co., Inc. ..... —
Scovill Mfg. Co. ..... —
Shulton Mfg. Co. .... Inside Back Cover
Snell, Foster D. 65
Sonneborn Sons, Inc., L. ..... —
Stepan Chemical Co. ..... —
Sun-Lac, Inc. ..... —
Synfleur Scientific Labs, Inc. 11

Thomasson of Pa., Inc. 62
Tombarel Products Corp. 17

Ungerer & Co. ..... Inside Front Cover
Universal Outlet 64

Van Amerigen-Haebler, Inc. 4-5
Vanderbilt Co., R. T. 32
Van Dyk Company, Inc. ..... —
Verley & Company, Albert ..... —
Verona Aromatics, A Division of Verona-Pharma Chemical Corp. .. —

Webb & Co., Inc., R. D. 58
White Metal Manufacturing Company —
Whittaker, Clark & Daniels ..... —
Will & Baumer Candle Co., Inc. ... 56
Wilson-Martin, Div. of Wilson & Co. Inc. ..... —

Rose
15 E. 48th St., New York

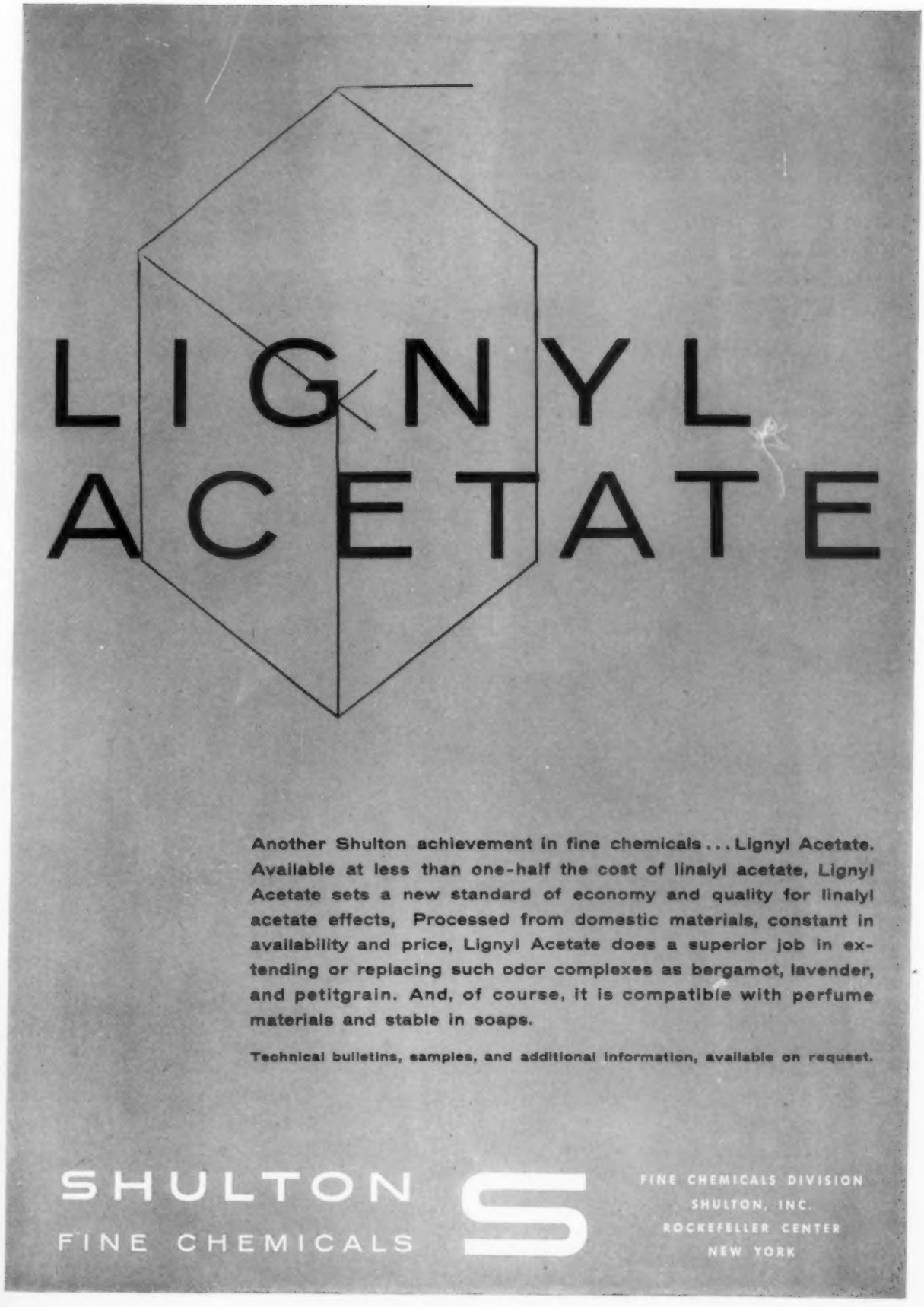
"MAXIMAROME"

"Naturals"

PLAZA 3-6070

CAMILLI, ALBERT & LALOUE, INC.

Jasmin
Grasse, France Tel: 870


LIGNYL
ACETATE
Another Shulton achievement in fine chemicals... Lignyl Acetate. Available at less than one-half the cost of linalyl acetate, Lignyl Acetate sets a new standard of economy and quality for linalyl acetate effects, Processed from domestic materials, constant in availability and price, Lignyl Acetate does a superior job in extending or replacing such odor complexes as bergamot, lavender, and petitgrain. And, of course, it is compatible with perfume materials and stable in soaps.
Technical bulletins, samples, and additional information, available on request.
SHULTON
FINE CHEMICALS
FINE CHEMICALS DIVISION
SHULTON, INC.
ROCKEFELLER CENTER
NEW YORK

New, Sales-Enchanting
Aerosol Perfume Dispenser

"Mini-Mist"™

Refillable Container

Holds 250 to 300 Metered Sprays

Lipstick-size (2⅞" long x ¾" diam.) luxury container refilled by changing fragrance cartridge. ✻

Glamorous outer cases available in gold, silver & black finishes with a wide variety of opulent, machine-engraved patterns or in the elegant simplicity of smooth polished metal. ✻

Inner cartridge holds about 2¼ drams in a seamless tube of aluminum or stainless steel topped by the Risdon patented metering valve and actuator. ✻

RISDON'S "Mini-Mist" is the only purse-size aerosol perfume package with all components manufactured and finished by one company. ✻

Metered Spray, Convenient Size and Corrosion-Proof features make the RISDON "Mini-Mist" ideal for aerosol *PHARMACEUTICALS*, too. ✻

Write or phone for further information, samples and prices.

THE RISDON MANUFACTURING CO. • Naugatuck, Conn.

Quality Lipstick and Perfume Containers and Aerosol Valves

FEB 2 1959